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ACUTE INTESTINAL OBSTRUCTION*

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Acute intestinal obstruction in spite of recent contributions concerning this subject still remains one of the most difficult conditions which the surgeon is called upon to treat. It is imperative in discussing intestinal obstruction to differentiate those cases in which there is no interference with the blood supply to the gut from those in which the intestinal vessels are more or less occluded; and those cases in which the obstruction is relatively high in the intestinal tract from those in which it is relatively low. The symptoms and signs of acute intestinal obstruction vary considerably with the location of the obstruction and also with the amount of vascular interference.

The symptoms of acute intestinal obstruction are dependent upon a number of factors. In addition to an obstruction to the fecal stream, patients with acute intestinal obstruction may have varying degrees of dehydration, hypochloremia and toxemia. In those cases in which the obstruction is relatively low in the intestinal tract, that is, within the colon or lower small bowel, the patient may have relatively few symptoms, except those dependent upon the mechanical hindrance to the intra-intestinal contents. Such an obstruction may exist for relatively long periods of time without the life of the patient being seriously jeopardized. In contrast to this relatively benign course an obstruction in the upper portion of the intestinal tract produces marked symptoms and the course is rapid and progressive, resulting in the death of the individual within a period of days if the obstruction is not relieved. These symptoms are much more marked both in the high and low obstruction, if in addition to the mechanical obstruction of the intra-intestinal contents there is an interference with the blood supply of the gut.

In all cases of mechanical obstruction, there is an attempt on the part of the intestinal tract to overcome the obstruction by increased peristalsis, which is responsible for the cramp-like pain complained of by patients with mechanical ileus. There also occurs a reversed peristalsis in the intestinal tract, resulting in vomiting. As the result of the loss of fluid and hydrochloric acid in the vomitus, dehydration and hypochloremia occur. Associated with the decrease of the blood chlorides there is a rise in the carbon dioxide combining power of the plasma (alkalosis). Haden and Orr[1] are of the opinion that the decrease in chlorides is due to a fixation of the chloride ion in the tissues by the toxin which is formed within the intestinal tract. Copher and Brooks,[2] however, because they were unable to find a decrease in the blood chlorides in animals with a "high" closed intestinal loop, believe that hypochloremia in ileus is not due to a fixation of the chloride radical, but is due to the loss of chlorides in the vomitus, as occurs in cases of pyloric obstruction.

That dehydration, hypochloremia, and alkalosis cannot account for the entire group of symptoms in high intestinal obstruction and in low intestinal obstruction in which there is interference to the blood supply to the gut is evident, because a correction of these factors is of no avail. There exists some additional factor, which is undoubtedly a toxemia, the toxin being derived from the lumen of the obstructed gut. There is considerable controversy among authorities concerning the character of this toxin and its mode of origin. The toxin is in all probability the result of an incomplete cleavage of the protein molecule. Murphy and Brooks,[3] as well as Whipple, Cooke and Stearns,[4] and Wilkie,[5] consider the toxin a proteose. Gatch[6] and his co-workers and Dale[7] believe that the substance is a histamine-like product. Nesbit[8] believes that the toxin is neurin. Schonbauer[9] believes that the toxic substance is tryspin. Dragstedt, Dragstedt, and their co-workers[10] are of the

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opinion that it is similar to the toxic amines. An outstanding criticism of the experimental work performed in the isolation of the toxin is that, with two exceptions, the toxin has been isolated from the intestinal contents and has not been obtained from the blood stream. However, Sugito[11] and Schofield[12] found that the blood obtained from the portal and mesenteric veins of animals dying from intestinal obstruction when injected into mice, caused the death of the mice.

There are many theories concerning the origin of these toxic products. These briefly are as follows: (1) toxins resulting from putrefaction of stagnating food within the intestinal tract; (2) toxins arising from bacterial invasion of the obstructed gut; (3) intoxication resulting from the absorption of abnormal secretions in an abnormal way or secretions which have not been detoxified; (4) intoxications produced from absorption of perverted intestinal secretion. All of the above are theories which have been advanced and none have been proved. There is, however, considerable experimental evidence to support the last three theories.

As mentioned above, patients with high intestinal obstruction and those with low intestinal obstruction in which there is interference to the blood supply of the gut show signs of toxemia, even though in the cases in which there is high intestinal obstruction there may be no apparent evidence of vascular change. Because of the difference in function of the upper and lower portions of the intestinal tract and the difference in the blood supply of these two portions of gut, a disturbance in blood supply probably occurs in all obstruction high in the intestinal tract. The mucosa in the upper intestinal tract is primarily secretive, whereas that in the lower portion of the alimentary canal is primarily absorptive. Morton[13] found that the duodenum secreted from five to ten times as much fluid as the ileum in a given period of time. As a result of this and also because of the presence of the biliary and pancreatic secretions in the upper intestine, the intra-intestinal pressure within the duodenum and upper jejunum is much greater than that in the ileum. Morton[13] found that there was considerable difference between the amount of pressure within a loop of duodenum and one of the lower ileum. Whereas the normal intra-intestinal pressure varies from 2 to 4 cm. of water, he found that after obstruction had been present for 24 hours, the pressure within the duodenum and ileum had increased to from 28 to 36 and to from 4.5 to 5 cm. of water, respectively. Dragstedt, Lang, and Millet[14] have shown that there is considerable variation in the intramural blood supply of the various parts of the intestine, and that as a result of this anatomical variation, pressure within the gut exerts varying influences on the blood supply of the gut. These authors found that the blood flow in the veins located in the walls of the intestine ceased when the intra-intestinal pressure within the duodenum, jejunum, ileum and colon attained a height of 35 to 45, 55 to 65, and 95 mm. of mercury, respectively. This difference, they believe, is due to variation in the length of the intramural blood vessels. They found that if a cross section of the bowel be represented by the face of the clock with the mesenteric attachment at six o'clock that the vasa recta pierced the muscularis in the case of the duodenum at approximately five and seven o'clock, in the case of the jejunum and ileum at five and three o'clock, and in the case of the colon at two and ten o'clock. In the duodenum any increase in the intra-intestinal pressure exerts considerable pressure on the vessels which lie between the mucosa and the muscularis. In the colon, however, in which the greater portion of the vessel lies outside the muscularis, an increase in intra-intestinal tone exerts relatively little effect on the blood supply. The marked increase in intra-intestinal pressure in cases of "high" intestinal obstruction as well as the peculiar blood supply of the duodenum and upper jejunum is in all probability responsible for the symptoms presented by these patients as an early interference with the blood supply occurs, the vascular occlusion being within the wall of the gut rather than without.

SYMPTOMS AND SIGNS OF ACUTE ILEUS

It is essential to distinguish between the mechanical and adynamic varieties of ileus, both from a standpoint of prognosis and treatment. The differentiation is, however, not always easy, because the adynamic variety frequently follows and may be superimposed upon the mechanical variety. The mechanical variety of ileus fortunately occurs much more frequently and offers a better prognosis. One of the earliest symptoms produced by mechanical obstruction of the intestine is pain, which is characteristically colicky and intermittent. In acute intestinal obstruction obstipation is often lacking, and no dependence should be placed upon this symptom. In fact, not infrequently following the onset of the patient's symptoms one or two evacuations of the bowel occur, probably due to the hyperperistalsis in that portion of the gut below the obstruction. Vomiting may be an early symptom,

especially in obstruction high in the intestinal tract. Examination of the abdomen often reveals nothing of significance, especially in high intestinal obstruction. In acute intestinal obstruction located in the distal portion of the intestinal tract there may be considerable distention proximal to the obstruction. The absence of distention, however, should never cause one to hesitate in making a diagnosis of acute intestinal obstruction. Auscultation of the abdomen is extremely important in those cases in which an intestinal obstruction is suspected. Early in the course of mechanical obstruction there is a marked increase in peristaltic activity, which can be elicited by auscultation. In the adynamic variety in contrast to the normal peristaltic sound, the abdomen is "ominously silent" (Deaver[15]).

An extremely important diagnostic procedure in acute ileus both in the mechanical and adynamic varieties is roentgenography of the abdomen without the use of contrast media. Because of the increased secretion and diminished absorption from the gut proximal to a mechanical obstruction or in loops of gut in adynamic ileus, there is an accumulation of fluid and gas within the gut. A roentgenogram obtained in such a way that localized gas collections above fluid levels within the loops of gut can be visualized on the roentgenographic plate is diagnostically of immense value. Technically, this may be obtained by securing an anterior-posterior roentgenogram of the abdomen with the patient in the upright position, either sitting or standing. In those patients who are too ill even to sit, a plate may be obtained with the patient on either the right or left side. The finding of multiple fluid levels capped above by gas is pathognomonic of acute intestinal obstruction. The value of this procedure as concerns early diagnosis is emphasized by Wangensteen and Lynch's[16] finding that within four to five hours after complete occlusion of the intestine of animals there is roentgenologic evidence of distention of the intestine proximal to the obstruction. Ochsner and Granger[17] report their results from the use of this procedure in 32 cases of intestinal obstruction. In 12 per cent of the cases the roentgenogram was diagnostic, even though the symptoms and signs were not definite.

The prognosis in intestinal obstruction depends not only upon the level of the obstruction, but also upon the type of ileus, whether it is of the mechanical or the adynamic variety. Of great importance, also, is the time of operation; the earlier the operation, the better the prognosis. As was aptly stated by Van Beuren,[18] "The longer a patient with intestinal obstruction lives before operation, the sooner he dies afterward". Miller[19] states that the mortality rate rises approximately 1 per cent for each hour of procrastination.

TREATMENT

Of most importance in the treatment of acute intestinal obstruction is early recognition of the condition, so that prompt therapy may be instituted. Much has been accomplished, both preoperatively and postoperatively, by the prevention and treatment of the hypochloremia in these patients by the intravenous and subcutaneous administration of sodium chloride solution. Large quantities of 1 per cent sodium chloride solution should be given intravenously as a preoperative measure. Gastric lavage is of extreme importance, especially preoperatively, in order to empty the stomach of the retained gastric and intestinal contents. Because of the danger of aspiration from the intestinal tract, general anesthesia should not be employed in acute intestinal obstruction. Preferably spinal or splanchnic analgesia, combined with local infiltration of the abdominal wall in the latter, are the methods of choice. The operative procedure varies with the lesion encountered. It is imperative that the obstruction be relieved in some manner. Frequently no attempt should be made to extirpate the obstructing lesion, because the operative trauma may be more than the patient can survive. There is probably no condition which requires more gentleness than acute intestinal obstruction. Bunnell[20] states, "Every manipulation is a shove nearer the grave." In such a case the operative procedure of simple drainage of the intestine above the obstruction is the method of choice. High enterostomy is also at times life-saving. Van Beuren,[21] who has had considerable experience with this procedure, states, "Enterostomy done at the right time in the right way is the most effective means we have at present to relieve and prevent intestinal overdistention and anemia".

Postoperatively, following the relief of the obstruction, the treatment is of extreme importance. Nothing should be administered by mouth until peristalsis is again reestablished. Patients should receive large quantities of fluids, from 3 to 4 liters in 24 hours, the fluid consisting either of a normal or 1 per cent sodium chloride solution together with a 5 per cent glucose solution intravenously, normal saline hypodermatically and either physiologic saline solution, 2 per cent glucose solution, or tap water

per rectum. Repeated determinations of the blood chlorides and the carbon dioxide combining power of the plasma should be made, and any hypochloremia should be combated by increasing the amount of the sodium chloride administered. Gastric lavage should be employed until all nausea and vomiting have ceased. The application of heat to the abdomen by means of electric light tents is of immense value in reestablishing peristalsis. Muller[22] believes that in paralytic ileus there is a decrease in the movement of the intestinal tract and an associated increase in secretions. Because of the viscerosplanchnic balance, he believes that the application of heat to the abdomen by producing a dilatation of the peripheral vessels causes a contraction of the splanchnic vessels. In so doing the secretion is diminished and motility increased. As an agent to stimulate peristalsis, the application of heat to the abdomen has in our hands been the most valuable one which we possess.

The treatment of the adynamic variety of ileus either as a primary lesion or that superimposed upon a mechanical ileus is more difficult than the treatment of the mechanical variety. Splanchnic block, either as a splanchnic or spinal analgesia, is of value in those cases in which too marked changes have not occurred within the gut wall. Spinal and splanchnic analgesia have been used in a large number of cases clinically, but in a recent investigation by Ochsner, Gage, and Cutting,[23] it was found experimentally that splanchnic analgesia is more efficacious than spinal analgesia in combating adynamic ileus in addition to producing a less marked drop in blood pressure. These authors feel from their experimental and clinical results that splanchnic analgesia is to be preferred to spinal analgesia in the treatment of adynamic ileus.

The use of drugs in ileus has been more or less disappointing, and the results have been inconstant. Ochsner, Gage, and Cutting,[24] in an extensive study of the effect of drugs on intestinal movement in normal animals and those with experimentally produced ileus, found that most of the drugs employed at present are of no value and in some instances are actually harmful. Pituitrin, physostigmine, peristaltin, pitocin, choline, acetyl choline, and hypertonic sodium chloride solutions were employed. The results obtained by the use of pituitrin were quite characteristic in that with but few exceptions there was a decrease in intestinal tone and peristaltic movement. A decrease in tone was noted in 16 out of 20 normal dogs. No change of tone was encountered in two cases and in only two cases an actual increase in tone occurred. These same results were found to exist also in animals with intestinal obstruction. In six of nine animals a definite decrease in intestinal tone followed the injection of pituitrin, and in none of the animals was the intestinal movement increased. Physostigmine, on the other hand, in all the normal animals with one exception invariably produced an increase in the tone of the intestine as well as increase in the amplitude of movement. In animals with intestinal obstruction physostigmine produced an increase in tone in eight cases, produced no change in three cases, and produced a decrease in four cases. The effect of choline on the intestinal tone and motility was inconstant and insignificant. Similar effects were obtained by the injection of acetyl choline and pitocin. Peristaltin either produced no change in intestinal movement or the change was in the direction of a decrease.

The use of hypertonic chloride solutions in the treatment of ileus has become comparatively popular recently, especially among the continental workers. Experimentally, Ochsner, Gage, and Cutting[25] were able to demonstrate that sodium chloride in a 20 per cent solution, when administered intravenously into animals with intestinal obstruction, produced both an increase in intestinal tone and an increase in amplitude. They feel that this agent is a valuable substance for use in the treatment of acute intestinal obstruction, but that it should be used cautiously because of the danger of increasing the coagulability of the blood.

CONCLUSIONS

Acute intestinal obstruction in spite of recent advances made is one of the most difficult conditions which the surgeon is called upon to treat.

It is important to distinguish both from a prognostic and therapeutic standpoint between high and low obstructions, those in which there is an interference with the blood supply to the gut and between the mechanical and adynamic varieties of ileus.

All patients with high intestinal obstruction suffer from dehydration, hypochloremia, and alkalosis. As a result of disturbance of the blood supply of the gut, due to the compression of the intramural vessels, an added factor is present in high obstructions as well as in low obstructions

in which there is an extramural obstruction of the blood vessels. This added factor is a toxemia, the character of which is not definitely known.

An early diagnosis in acute intestinal obstruction is imperative and is not difficult, because of the characteristic history of colicky, intermittent pain associated with increased peristalsis in the mechanical variety of ileus, which can be elicited by auscultation of the abdomen.

Of extreme importance as regards diagnosis is roentgenography of the abdomen without the use of contrast substances.

Early relief of obstruction is imperative. Hypochloremia and alkalosis must be combated, and in the treatment of the adynamic variety splanchnic block, preferably by splanchnic analgesia, is of value.

Drugs in the treatment of ileus are of relatively little value, physostigmine and hypertonic sodium chloride solutions giving the best results.

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JAMAICA GINGER PARALYSIS*

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The case presented today is one of a relatively small group of cases of so-called jamaica ginger paralysis which we have had the privilege of observing, in association with other members of the staff, at the Louisville City Hospital during the late winter and early spring of this year.

Some ten or more cases were sent to the hospital from the southern part of the state, at the request of the State Board of Health, for observation and study. Cases originating in Louisville had not been reported at the time the first group was admitted, but there were later received at the hospital a few isolated cases from our own community, most of which had, however, obtained their ginger extract from outside sources. On account of the small number of cases originating in Louisville it was assumed that either very little of the adulterated extract was on sale here, or there was no demand in this community for such a poor alcoholic substitute.

All of our cases were either young or middle aged adults and there was a decided predominance of the male sex. Practically all of them gave the history of having used alcoholic beverages, either moderately or in excess, for a number of years; but none gave the history of having used quantities of alcohol continuously for such a period of time that would have been likely to produce an alcoholic polyneuritis, which was first suspected.

From February to June of this year, according to a statement from Dr. J. L. Jones, our State Epidemiologist, there had been reported from the various county health officers in Kentucky 625 cases. Replies were received from only 70 counties, however, and a few cases developed in some of these counties subsequent to their reports. No reply was received from the remaining 50 counties, but it was known that cases of "ginger paralysis" existed in some of these. In view of these data it was believed by Dr. Jones that 800 cases would be a conservative estimate for the state. There has been no official report of new cases since June.

The symptoms of these cases, and a few private ones which have come under our observation, have not been essentially different from

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those reported in other communities, and have, in a general way, coincided with the report of cases published in the May issue of the SOUTHERN MEDICAL JOURNAL by Dr. C. R. Bennett, of Meridian, Mississippi, and Dr. Seale Harris, Jr., of Birmingham, Alabama.

In the majority of our cases the so-called period of incubation ranged from ten days to three weeks following the last ingestion of the ginger extract, but in some a period of six weeks, or more, had elapsed before the onset of the earliest symptoms, and in some cases no more than a two-ounce bottle of the extract had been consumed. Other patients reported that members of their family, or friends, had taken moderate amounts of the same brand of extract with no ill results, indicating a higher susceptibility in certain individuals.

Almost uniformly, the first symptom noted was soreness in the muscles of the legs which had existed for several days before the patient realized that the toes could not be moved. Both legs were usually affected and there soon followed bilateral foot drop. At about the same time it was noted that there was some subjective numbness and tingling of the fingers and toes, but definite weakness in the fingers and wrist drop did not appear for another week or ten days. In most cases the disability in the hands and forearms was never as great as in the feet and legs. The majority of our cases were bedridden on admisison to the hospital and only a few patients could move about in their beds with the greatest difficulty. The paralysis in the upper extremities did not usually extend beyond the elbows. In the lower extremities there was an apparent, but not definite, involvement of the thigh muscles in one or two cases.

There was no evidence of optic neuritis or other eye-ground changes, and no involvement of other cranial nerves. Chest muscles were not affected.

With the exception of occasional exaggeration of the knee jerks, a somewhat atypical manifestation in most cases of polyneuritis, the tendon reflexes were usually diminished, or absent, in all extremities affected. Oppenheim, Gordon and Babinski signs were all negative, and there was no ankle clonus. There was some incoordination of muscular movements as a result of diminished muscular power. Cases tested for the reaction of degeneration showed a lessened or absent response of the nerves to the faradic current, but the muscular response to the galvanic current was usually well preserved. There had been no definite signs of muscular atrophy in any of the cases up to the time they left the hospital in from one to six months from the time of their admission. The extensor groups of muscles were usually most affected, but there has not appeared to be much, if any, tendency to contracture thus far.

There was no involvement of the sphincter muscles, and vasomotor tone was apparently not much affected in our cases. Objective sensory disturbances were strikingly absent in the majority of cases, but in some there was a slight reduction in the sensations of touch, pain and temperature, and the sensation of position was somewhat impaired in these cases. Abdominal and other superficial reflexes were usually well preserved.

The type of paralysis was essentially that of a peripheral multiple neuritis, definitely flaccid in character, indicating a lower motor neuron involvement, without disturbance to the brain or spinal cord. If the anterior horns of the latter have escaped, as we believe they have, there should be no muscular atrophy except that which might result from prolonged disuse.

While the cases were in some respects similar to the polyneuritis of alcoholic origin seen more frequently in this country during the pre-Volstead days, there was an absence of the typical alcoholic history which we formerly obtained in such cases, and no case presented any evidence of mental confusion suggesting a Korsakow's psychosis. The absence of any marked sensory disturbance, other than soreness in the calves of the legs and some subjective sensations of numbness and tingling of the fingers and toes, was, to say the least, unusual in most cases of alcoholic neuritis, and we believed very definitely ruled out the probability of an arsenical poisoning.

Other chemicals were considered, however, and on account of the history of gastro-intestinal upsets in some of the cases, and the great tendency to wrist drop in most of them, lead was at once suspected as having been a contaminating agent, upon the hypothesis that the ginger extract may have been manufactured or stored in metallic containers previous to its distribution in bottles of glass.

In addition to routine laboratory examinations, including blood chemistry and spinal fluid studies, all of which were essentially negative with the exception of a positive blood Wassermann in two of the cases, special blood studies were made for evidences of marked anemia, basophilia and stippling of the red blood cells, which latter phenomena are usually present in

acute or chronic lead poisoning. All of these were absent in the cases examined in this way. For this reason, the theory of lead poisoning was less seriously considered, but not entirely abandoned.

About this time, however, extensive studies of samples of ginger extract which were suspected to have been adulterated for beverage purposes were begun by workers in the Hygienic Laboratory at Washington, and we awaited with much interest the results of their labor.

In a bulletin from this laboratory, now a part of the National Health Institute, under date of July 25, 1930, entitled: "Pharmacological and Chemical Studies of the Cause of So-called Ginger Paralysis," Maurice E. Smith, M.D., and E. Elvove, Ph.D., made a preliminary report of their work, and that of others associated with them. After experimenting with 13 suspected samples of the fluid extract of ginger obtained from various sources in Ohio, Tennessee, and Oklahoma, at least six of which were adulterated, it was found that ginger paralysis of various degrees like that occurring in the human could be produced by the administration, both by mouth and subcutaneously of small quantities of these samples to rabbits, dogs, monkeys and calves, in the latter of which the human type of disease could be most faithfully reproduced. By careful chemical and pharmacological studies they came to the tentative conclusion that the offending agent was most probably a phosphoric ester of one or more of the cresols, or in other words, a cresol phosphoric acid ester.

In a later, and what now appears to be a final report, a copy of which I have in manuscript, but which has not yet been published, these same workers, after further experiments with calves, and finally with chickens, the latter being more suitable for experimental purposes, have reached the definite conclusion that the etiological factor of the so-called ginger paralysis, which is found in adulterated samples of the fluid extract of ginger, is tri-ortho-cresyl-phosphate. It was found in the proportion of approximately 2 per cent in the samples of ginger examined, and they report that no more than one or two ounces of the adulterated commercial product may be required to produce paralysis in man.

So far as I know, there have been no deaths from ginger paralysis in Louisville, and very few have been reported from other parts of the country. The only autopsy report which I have seen in the medical literature to date is that by Dr. Hugh Jeter, of Oklahoma City, a recent graduate of the University of Louisville School of Medicine.

He relates a typical case of so-called ginger paralysis in a white man, 66 years of age, who had, in addition, definite signs of an advanced arteriosclerosis. This patient died in an apoplectic seizure during the course of his illness, which up to that time had been uneventful except for his acute symptoms of multiple neuritis. The gross anatomic diagnosis was: cerebral edema; generalized arteriosclerosis, and congestion of the kidneys.

The microscopic examination of the brain and cord revealed the usual changes of arteriosclerosis, but nothing suggested an acute inflammatory process. A section of the cauda equina showed a perineural exudate composed chiefly of lymphocytes, many of which were large; a few scattered polymorphonuclear leucocytes; many red cells and a slight amount of fibrin. There was no definite thickening or important visible change of the endoneurium, but the blood vessels within the funiculi were dilated and engorged with red cells. Microscopic examination of the anterior tibial nerve showed great thickening of the perineurium in all sections, only one having an exudate less extensive than that found in the cauda equina. No micro-organisms could be demonstrated in the exudate of any of the nerves. The perineural exudate was believed to be an acute process, and was limited to the peripheral nerves and to patches along the nerves. This report was published in the *Journal of the American Medical Association* of July 12, 1930, and contains micro-photographic pictures showing exudate in the cauda equina and the anterior tibial nerve.

Regarding treatment for these unfortunate individuals, we have nothing new to suggest, and in the care of our cases have followed the usual well known methods which have more recently been applied to other types of multiple neuritis. They should, first of all, have good general hygienic care, with plenty of rest in bed during the acute stages; and after all signs of the acute inflammatory process have subsided, it is recommended that such measures be used as may best keep up the nutrition of the muscles affected until the nerves have, if possible, undergone complete regeneration. Massage and galvanic electricity are of value in some cases, and the extremities affected should be kept in such position as will best prevent contractures which may result from over activity of the flexor groups of muscles which are usually least affected.

CASE REPORT

C. P., an adult white woman, age thirty-seven, married, was admitted to the medical department of the Louisville City Hospital on April 24, 1930. Her chief complaint at the time of admission was inability to walk, difficulty in using the right hand, aching pain in the calves of the legs, and numbness of the extremities. She dates the onset of her present illness to March 21, 1930, at which time she noticed on arising one morning that her ankles felt strangely stiff, as though she had been dancing all night. This stiffness, although increasing, did not prevent her from completing her usual

household duties. The following morning definite weakness of the feet was present and her toes felt numb. She could walk with support. One day later the paralysis of the feet became complete and the patient remained confined to bed. The aching pain in the muscles of the calf noticed at the onset gradually became more pronounced. Local remedies and medicine administered by a physician failed to relieve the condition. About ten days following the involvement of the feet, the patient noticed that she had difficulty in using the right hand. The thumb and index finger were particularly involved, and she was unable to perform the finer movements of buttoning clothes or picking up a pin. A complete paralysis did not develop. Her condition, she stated, had remained practically the same until the time of her admission to the hospital.

Past History.—The patient stated that she had always enjoyed good health until the time of onset of her present illness. She is alert mentally and physically, and of pleasing personality. She has always had access to alcoholic beverages, and several months previous to the onset of her illness had been drinking questionable liquor at parties. In particular, she gave a history of drinking two or three ounces of jamaica ginger a few weeks previous to the time of onset of her symptoms. She experienced no untoward symptoms at this time. Briefly, the past history is otherwise irrelevant. There is no history of mental or nervous diseases in the family.

Physical examination on admission to the hospital revealed a well developed and well nourished woman of average mental capacity.

The head was negative. The pupils were equal and regular, reacting to accommodation and light. There was no nystagmus, and no ptosis, and the ocular movements were normal. Ophthalmoscopic examination was essentially negative. The ears and nose were negative. The skin was negative. The teeth were in good condition. The tonsils were enlarged and injected. The neck was negative.

There was no enlargement of the heart. Sounds of normal relative intensity in all valve areas were heard. There were no adventitious sounds.

The lungs were clear.

The abdomen was essentially negative save for a suprapubic midline postoperative scar.

The genitalia were negative.

Neurological Examination at the Time of Admission.—The cranial nerves were negative. The radial reflexes were diminished. The biceps and triceps reflexes were present and equal. The knee jerks were present and active, the left being more active than the right. The Achilles tendon reflex was not elicited. There was no ankle or patellar clonus. No Babinski, Oppenheim, or Gordon reflex was elicited. The abdominal reflexes were present.

Bilateral foot drop was present, though the posterior calf muscles were affected as well as the anterior ones. Paralysis did not involve the muscles of the thigh and the patient experienced no difficulty in flexing the knee. She was unable to walk. No muscular atrophy was observed. The thumb and index finger of the right hand were paralyzed and the patient experienced difficulty in performing fine coordinated movements, as in picking up a pin. However, no typical wrist drop was observed. The motor power was normal in the left hand and there was a definite weakness in the grip of the right hand.

Although the patient complained of subjective sensations of numbness in the feet, objectively no sensory disturbance of note could be made out. The sphincters were normal. No disturbance of the protopathic system was elicited that could not be attributed to muscular weakness.

Laboratory Findings on Admission.—The urine was yellow, cloudy, acid; the specific gravity was 1.010. Albumin and sugar were negative, and microscopic examination was negative. The blood count showed 4,800,000 red cells; 8,900 white cells, and 70 per cent hemoglobin.

Differential count showed 72 per cent polymorphonuclears and 26 per cent lymphocytes. The blood smears revealed no abnormal cells. There was no evidence of stippling of red blood cells, and there were no basophils. Recent blood counts and urinalyses have been negative, and the hemoglobin of the blood has risen from 70 to 90 per cent.

A complement fixation test of the blood was definitely positive, but not a factor, we believe, in the production of any symptoms thus far noted. The spinal fluid Wassermann was negative. The globulin was negative. No cells were found in the spinal fluid.

Course in Hospital.—On admission the patient was placed at rest in bed and was given sedatives for pain in the calves of her legs. Plaster splints were applied to both lower extremities to maintain the feet in a position of flexion, thus combating the foot drop. An electric bake was placed over the leg in an attempt to relieve the cramping and numbness of which the patient complained. Thorough elimination from the gastro-intestinal tract was instituted. General systemic treatment, sedatives for pain and to promote rest and sleep, were used as indicated. In view of the positive blood test, appropriate treatment for this condition has been given, both intravenously and intramuscularly. A full nutritious diet has been maintained throughout. No immediate improvement was noted in the paralysis, although the pain gradually subsided. After a period of about one month the splints were removed and general massage of the calf muscles was instituted. The patient was permitted up daily in a wheel chair and was given sun baths on the roof of the hospital. Intermittent swelling of the feet was noticed at this time. It disappeared after a few days' rest in bed, but tended to recur with the patient in the erect posture. About two months ago the patient was allowed to stand alone and was able to take a few steps with support. From this time on muscular strength in the legs gradually began to return. About five weeks ago the patient began to take a few steps unaided. She tires easily, however, and a slight bilateral foot drop persists with a slight tendency to drag the toes when walking. The right hand has practically returned to normal, and she is now able to perform fine coordinated movements without difficulty. Except for the improvement of the musclar weakness, there has been no significant change in the neurological picture. It may be stated here that inasmuch as the etiology of the condition was not clear at the time, and thought to be due possibly to heavy metallic poisoning, it was believed that the administration of sodium thiosulphate might have a beneficial effect on the paralysis. Accordingly, on July 3, the patient began a course of 16 doses of intravenous sodium thiosulphate (1 gm. each) administered at intervals for a period of about thirty days. The improvement that

resulted could not be correctly attributed to the use of this therapy.

In conclusion, it may be stated that the patient is now showing steady improvement and we believe that in the absence of other intercurrent illness, she will probably recover within the course of another two or three months.

EYE OBSERVATIONS IN EPIDEMIC CEREBROSPINAL MENINGITIS*

By PHIL M. LEWIS, M.D.,
Memphis, Tenn.

During the past year, mostly in the first six months of 1930, a considerable epidemic of meningococcic meningitis occurred in the city of Memphis and the surrounding territory. Most of the cases were treated in the City Isolation Hospital. Since the beginning of the epidemic several hundred cases have been treated in this institution. Just how many of these cases had eye complications it is impossible to tell, since an examination by an ophthalmologist was not made routinely until the first of May, 1930. At that time, I was attracted by several interesting eye findings among these patients and therefore decided to examine all cases of meningitis admitted to the hospital. In a little over two months (after which the epidemic had practically subsided), I examined a total of 65 cases. Several patients who died within a few hours after entering the hospital I had not the opportunity to examine.

Previous to this epidemic I had seen very few cases of meningococcic meningitis, none with eye complications, and had seen no literature on this particular subject. I, therefore, fancied that our cases, with a purulent looking exudate in the vitreous, were something entirely new. I soon discovered my error. Fuchs[1] mentions a purulent chorioiditis occurring in this disease. Knapp,[2] Kreitman,[3] Salomon,[4] Jacobi,[5] Hirsch,[6] Ziemsen and Hess,[7] in the German literature described ophthalmic complications around the year 1865.

Randolph,[8] in 1893, wrote an excellent report of a study of 40 cases. He found that eye symptoms were very common. In only three of his cases were eye symptoms entirely absent. Optic neuritis occurred in six cases. There was one case of retinitis and thrombosis of the central vein. Nineteen were characterized by great engorgement and tortuosity of the retinal veins and congestion of the discs. Eight cases had strabismus, which was always divergent and in each case involved the right eye. He called attention to the fact that the right eye was much more frequently involved than the left in meningitis. There is no reason for this and we did not find it true in our series. Randolph noted conjunctivitis frequently, which did not occur in our cases. He, however, did not record a single case of iritis nor any case with the formation of a purulent exudate in the vitreous. Hirsch,[6] also Ziemsen and Hess,[7] described conjunctivitis as an almost constant occurrence in meningitis. Randolph stated that every extensive epidemic of meningitis was apt to be associated with a special type of eye affection. This seems to be true. For example, conjunctivitis was absent in our series, while many observers described it as the most frequent complication. McKee,[9] for example, saw 7 cases of epidemic meningitis with ocular complications, 6 of which were conjunctivitis.

Zweig[10] reported 2 cases of iridocyclitis complicating epidemic meningitis, one of which ended in pthisis bulbi. Weil and Jost[11] reported a case of interstitial keratitis in the course of meningococcemia. Endelman,[12] in 1922, reviewed the literature and cited a patient who lost his sight from metastatic ophthalmia in meningitis. Wissman,[13] in 1923, reported seeing 7 cases of optic neuritis and also vascular changes in epidemic meningitis. Vinsonneau,[14] in 1914, reported two ocular complications in 14 cases of epidemic meningitis.

FREQUENCY AND TYPE OF EYE SYMPTOMS

In 65 cases of meningitis, 33 were found to have normal eyes. Thirty-two, or 49 per cent, showed some deviation from the normal. In 13 cases, or 20 per cent, the changes consisted simply in an hyperemia of the disc and retina or an engorgement of the retinal veins. Real pathological change was encountered in 19 cases, or 29 per cent.

DESCRIPTION OF EYE LESIONS

(1) *Strabismus.*—There were 3 cases with convergent squint, none with divergent. Randolph[8] found only divergent squints in his series and it is stated in Ball's[15] text-book that the third nerve is the one usually affected. So few of our cases developed any strabismus that no conclusion can be drawn regarding the nerve most frequently involved. These 3 patients were all children and all recovered from meningitis,

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*From Department of Ophthalmology of University of Tennessee.

TABLE I

Eye Findings in Epidemic Meningitis

Diagnosis	No. of Cases	Percentage
Normal	33	51
Conjunctivitis	0	0
Keratitis	0	0
Strabismus	3	4.6
Pupillary abnormalities	2	3
Iridochoroiditis	9*	13.8
Papillitis	3	4.6
Hyperemia of disc and retina	7	10.7
Simple engorgement of retinal veins	6	9.3
Blindness without ophthalmic lesion	2	3
Total	65	100

but the esotropia had not improved when they left the hospital.

(2) *Pupillary Abnormalities.*—We noted very few pupillary changes. However, at least half of these patients had homatropine instilled before I examined them. A number of cases had large doses of morphine before admittance and therefore had pin-point pupils. Posterior synechiae were constant findings in the cases of iridochorioiditis and are placed under that heading.

Two patients, both children, had dilated and fixed pupils. Both recovered from meningitis and their pupils had returned to normal before they left the hospital. Bernouli[16] and Lechler[17] both reported seeing a loss of pupillary reflexes from cerebrospinal meningitis.

(3) *Iridochorioiditis or Endophthalmitis.*—These cases were, to me, extremely interesting, but they were uniformly hopeless. Twelve eyes in 9 patients had this complication. It developed usually in the first week or ten days of the disease, never after the second week. Pain was practically never complained of by these patients. The condition was discovered by routine ophthalmic examination or by the patient's finding that he could not see with one or both eyes. Usually a slight or moderate ciliary injection was the only external finding. The use of a mydriatic revealed the posterior synechiae which were present. The lens in one case had an exudate over the central portion of its anterior capsule. The lenses in other cases were clear.

The vitreous always showed an exudate which, however, varied considerably in different cases. In some it was of a grayish white color and in others it was quite yellow. It was always fixed in position and had the typical appearance of a cyclitic membrane. In several cases it was distinctly funnel shaped. No fundus reflex could be obtained in any case and all ended in blindness of the involved eye. Two cases developed an orbital cellulitis with great proptosis, so that the cornea was constantly exposed. In one of these cases ulceration of the cornea, with subsequent perforation, occurred in spite of our efforts. Enucleation was necessary. The pathology will be described in a later paper.

Knapp[2] saw 10 of these cases and considered the condition a hyperplastic chorioiditis, with consecutive retinal detachment and iritis. Kreitman[3] observed the same condition in 12 or 15 cases and Salomon[4] in 6 cases. Both considered the condition a simple iridochorioiditis. Jacobi[5] regarded the disease as a purulent inflammation of the iris, ciliary body and chorioid. Metz-Klok[18] enucleated and examined one eye with this complication in a child of four months who died. He considered the condition an exudative hyalitis and found only slight changes in the ciliary body and chorioid. Thrombosis of the central vein was present in his case.

(4) *Papillitis.*—Only 3 patients showed this complication. In one the inflammation was very mild, in the second it was moderate, and in the other case very severe.

The latter case, which ended fatally, showed 3 to 4 diopters of swelling of the disc, great tortuosity of the vessels with dilatation of the veins and numerous hemorrhages. Both eyes were equally affected. At autopsy a massive fibrino-purulent exudate was found covering the entire base of the brain, but most pronounced in the region of the optic chiasm and around the cerebellum. All the ventricles were greatly dilated and the central canal of the spinal cord was closed with purulent exudate.

(5) *Vascular Changes.*—Thirteen cases showed sufficient vascular changes to attract attention. In 7 there was a definite hyperemia of the disc and retina, the disc appearing quite red, but not elevated. In 6 cases the retinal veins only were engorged and had a darker appearance than normal. This venous change was noted by Randolph[8] in a number of his cases.

(6) *Blindness Without Visible Lesions.*—Two patients of our series became blind without any ophthalmoscopic changes.

The first was a negro male,* 21 years of age, who, on the sixteenth day of illness, awoke complaining that he could not see. He stated that his sight was all right the night before. Examination showed he had no perception of light. His pupils were dilated and fixed, but had no synechia. The media were clear and the fundi entirely normal. This man was totally blind for almost three weeks when he began partially to recover his sight. His right eye improved to the counting of fingers at 3 feet and the left gradually to 20/20, but with greatly reduced field. The disc of the right eye

*Two of these cases developed an orbital cellulitis.

*A detailed report of this case with charts of fields will be published later.

TABLE II
End Results in Meningitis Cases Having Ophthalmic Complications

Diagnosis—	No. of Cases	Recovered From Meningitis	Died	Eyes Recovered or Improved	Eyes Not Improved	Permanent Blindness Unilateral	Permanent Blindness Bilateral
Strabismus	3	3	0	0	3	0	0
Pupillary abnormalities	2	2	0	2	0	0	0
Iridochoroiditis	9	7	2	0	9	6*	3
Papillitis	3	2	1	2	1 (Died)	0	0
Hyperemia of discs and vascular engorgement	13	10	3	10	3 (Died)	0	0
Blindness without ophthalmic lesion	2	1	1	1	1 (Blind at time of death)	1	0
Total	32	25	7	15	17	7	3

*Two of these died.

is becoming pale. Apparently optic atrophy will be the outcome.

The second case was a colored baby only five months old on admission to the hospital. The eyes were then apparently normal, the pupils being equal and reacting normally. The child was extremely ill and had a stormy time, but was apparently recovering when, at the end of the fourth week, it was noticed that it did not seem to see as it had done previously. Examination showed the pupils moderately and equally dilated and inactive. Sudden movements towards either eye, as if to strike it, caused no winking movement or change of expression. The media were clear and the fundi perfectly normal.

The child's condition rapidly became worse and death occurred after forty-three days in the hospital. Permission for autopsy was refused. I examined this child's eyes almost daily for two weeks before its death, but no abnormality in either the media or fundi was ever discovered to account for the blindness.

The cause of blindness in these cases is somewhat obscure. Sudden blindness of both eyes such as the first case exhibited could hardly be produced except by a lesion affecting the visual areas of both occipital lobes. A collection of pus between the posterior portions of the occipital lobes might, by pressure or the infiltration of toxins, affect both visual areas simultaneously. However, in this patient, who recovered, an optic atrophy is now becoming apparent. Therefore, a lesion must also have been present anterior to the primary optic centers.

TREATMENT OF CASES

I shall not dwell on the treatment, as there is little that the ophthalmologist can do for these cases. The instillation of atropine drops and subconjunctival injections of epinephrin are used to prevent and break up the posterior synechiae. The main treatment is the administration of the antimeningococcic serum, both intraspinally and intravenously. This, however, is a matter for the general physician or pediatrician.

McLean and Gilmartin[19] reported great improvement in a case of purulent iridocyclitis complicating meningitis from the intensive use of serum intravenously and intraspinally. Absolutely no improvement occurred in any of our cases with purulent intraocular infection, although the serum treatment was given most intensively. Herrick[20] also reported that large intravenous doses of serum seemed to prevent serious ophthalmic complications, which may be true, as it is impossible to tell how many more complications we might have had if the intravenous use of serum had not been employed.

END RESULTS

These are best seen by examining the following table:

Of the 32 cases with ophthalmic changes only 7 died. This is a mortality rate of only 21.8 per cent, which is considerably lower than the death rate for all cases during the entire epidemic. This low mortality was undoubtedly merely a coincidence. Of the patients who recovered, 5 were permanently blind in one eye, 4 from endophthalmitis and 1 from a central lesion. Three patients, all children, were left with a complete and permanent blindness of both eyes.

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DISCUSSION (*Abstract*)

Dr. Gilbert Levy, Memphis, Tenn.—My work is pediatrics, not ophthalmology, but I have watched with pleasure the work of Dr. Lewis.

This epidemic has been the most serious in the history of Memphis. Sixteen years ago we had a severe epidemic of 100 cases with 50 per cent mortality. The present epidemic is not terminated, and 300 cases have been reported so far this year. I shall briefly discuss 216 cases which occurred between January 1, 1930, and June 25, 1930.

Intensive treatment has been resorted to, but the most successful treatment certainly has been the injection of meningococcus antitoxin, intravenously, intraspinally and intracisternally. Intravenous injections are given every twelve hours for three days, intraspinal injections every twelve hours for three days, and continued until the spinal fluid is free of organisms on two successive occasions, with two successive negative cultures. Of course during this time frequent blood cultures are made. It is my opinion that cases of meningococcic meningitis are septicemic in nature. Treatment should always be intravenous in the beginning of the condition. I believe the blood stream infection is transient in many of these cases, but regardless of the transient condition intravenous medication should be resorted to.

This summer I had the opportunity to visit a number of cities where similar epidemics had occurred. In Detroit they are using very large doses of serum intravenously in saline in addition to serum intraspinally and intracisternally.

Since this was written we have seen approximately 45 cases, but are getting no better results at present than in the past. However, we are using an antitoxin made from our own epidemic strain, plus those strains taken from outbreaks in Detroit, Kansas City, and Chicago.

Dr. J. N. Greear, Jr., Washington, D. C.—I have never had the opportunity to study a large number of patients with epidemic meningitis. My experience has been confined to a small number of sporadic cases of this disease.

The most frequent eye complication in my experience is a mild hyperemia of the discs with engorgement of the retinal veins.

In reviewing the literature it is found that epidemics of cerebrospinal fever differ greatly both in the severity of symptoms and in the complications. Sinclair calls attention to this fact in reporting on the epidemics in Suffolk in four successive years. All the eye complications occurred during one year only, and the mortality dropped to its lowest in that year.

There appears to be a striking contrast between the endophthalmitis produced by the meningococcus and the acute panophthalmitis associated with other organisms. There have been several cases of metastatic ophthalmitis reported in which there was no history suggestive of meningitis. However, the meningococcus was isolated from the exudate within the globe. Coats believes that a specific causal relation may be established between pseudo-glioma and the meningococcus.

In a clinical study of 144 epidemic cases reported in the *Journal of the American Medical Association*, September 13, 1930, strabismus is given as one of the most frequent early symptoms of the disease. It occurred in 31.2 per cent of the cases reported. The oculomotor nerve was the most frequently involved. Conjunctival hemorrhage occurred in 30 of their cases.

Acute hydrocephalus may develop in meningitis where there is a diminution in the absorption of the cerebrospinal fluid, and this condition should always be suspected with the persistence of symptoms of meningeal irritation, or their reappearance after the symptoms of meningitis have subsided. Manifestations indicative of increased intracranial pressure are often seen at the onset of acute meningitis and throughout the course of the disease. These do not necessarily mean that hydrocephalus is present.

In the presence of hydrocephalus, where the intracranial pressure is elevated sufficiently, a papilledema will develop. The ophthalmoscopic findings in this type of case should be of tremendous value to the internist as a guide to the treatment.

Dr. Adolph O. Pfingst, Louisville, Ky.—Dr. Lewis was fortunate in having had the opportunity of examining such a large number of patients in his study of the subject. My experience is limited and embraces only isolated cases, most of them seen after the acute symptoms of meningitis had passed and sequelae remained. It has been my pleasure very recently to be present upon two occasions when the subject of meningococcic meningitis was under discussion, and I gained the impression that the eye symptoms of the disease were rather minimized.

There was a time when the eyes served as the most important diagnostic organs in cerebrospinal meningitis, and even now when laboratory examinations, especially the study of the spinal fluid, are perhaps of greatest importance in the diagnosis of this disease, the importance of eye symptoms should not be overlooked.

According to the figures of Uhthof, that great student of the eyes in diseases of the nervous system, ocular signs are found in somewhat more than 50 per cent of cases. In 110 studied cases Uhthof found optic neuritis present eighteen times, bilateral in 17 cases. This average is recorded by other observers and coincides with the essayist's figures, were we to interpret his cases of hyperemia of the disc as cases of papillitis. Papillitis occurred as a rule in both eyes, though unilateral cases have been noted. I was interested to note that one of Dr. Lewis' cases recorded as papillitis was a true papilledema with an elevated disc of ¼ diopters. According to Uhthof, papilledema, or real choked disc, is very rare in this disease; in fact, he questioned whether it had ever occurred.

Along with the optic neuritis, defective central vision, and increase in the size of the physiological blind spots have been noted.

Not infrequently amblyopia, or even amaurosis, occurs in cerebrospinal meningitis without apparent involvement of the nerve, as was pointed out by Dr. Lewis. These cases occur either as the result of the action of toxins on the higher visual centers, in which case blindness may persist for weeks, and after which vision is gradually restored to normal, or as the result of basilar involvement of the optic nerve trunk. In

either case there is an absence of abnormal ophthalmoscopic findings.

The next most frequent of the ocular signs is the involvement of the extrinsic ocular muscles. Sixteen cases were found in Uhthof's 110 cases. In half of these the abducens was involved, usually unilaterally, causing a convergent squint and a homonymous diplopia. The preponderance of abducens paresis is the experience of nearly all observers, so that one might almost gain the impression that Randolph's observation of 8 cases of divergent strabismus in 40 cases, as quoted by Lewis, might not have been correctly quoted. If they were, his was a very unusual experience.

Involvement of the third nerve in its entirety is infrequent, though involvement of one or more of its branches is a common occurrence in cerebrospinal meningitis. Nystagmus occurs but it is not a frequent symptom. Ptosis is reported rather frequently.

Anomalies of the pupils occurred in 12 of Uhthof's cases. The pupils are contracted in many cases and only dilate in the serious cases after coma sets in. Reflex activity of the pupils is sometimes lost (4 per cent of cases). Keratitis occurs, though infrequently, in cerebrospinal meningitis. It may be associated with sloughing cornea and loss of the eye. Conjunctivitis is frequently observed.

Perhaps the most serious sequela of this infectious disease is a plastic or purulent inflammation of the uveal tract occurring as a metastatic condition. Uhthof found this present in but 4 per cent of his cases, whereas I note that Dr. Lewis found it in 13.8 per cent of his. As iridochorioiditis leads to hopeless blindness, it is fortunate that it occurs in the great majority of cases as a unilateral involvement.

The discrepancy of figures of various observers indicates that each epidemic is associated with a certain type of eye involvement, just as we find one epidemic of influenza complicated with mastoid involvement, another with sinus affections, and so on. Experience also indicates that the severity of the eye affection is not as a rule in direct proportion to the severity of the primary lesion.

Dr. Fletcher D. Woodward, University, Va.—I would like to ask Dr. Lewis whether he made any observations in regard to the eighth nerve in these cases?

Dr. W. M. Brown, Livingston, Tenn.—About two years ago I had occasion to see 3 or 4 of these cases in consultation. The physicians treating these cases did not seem to take any particular precautions to protect themselves. I became infected and was a carrier for one year. I would like to ask Dr. Lewis what he did to protect himself during this epidemic.

Dr. J. W. Jervey, Greenville, S. C.—I have never had an opportunity to study epidemic meningitis, and I rise to make only one observation: that is, that any or all of the tissues of the eye are liable to involvement in any or all forms of meningitis. I think that should be borne in mind.

Dr. Lewis (closing).—Since writing this paper I have seen two of the cases which had strabismus, and both have recovered. In other words, their eyes have become straight and the movement of the eyes in the paralyzed field is recovered so that you can not tell that they had been paralyzed. That is important, because somebody might consider an operation for squint in one of these cases before allowing sufficient time to elapse for spontaneous recovery. I think a year or two should be allowed to elapse after recovery from the meningitis before the squint should be considered surgically.

As Dr. Levy brought out, the mortality in this epidemic was around 45 per cent, and the mortality in our eye cases was about 21 per cent. That would certainly suggest that the eye complications occurred more often in the mild cases than in the severe cases of meningitis. Whether or not that is really true I cannot say. We had some very sick patients who had eye complications, and some died, but I believe that is true of mild cases. More of them have ocular complications than the severe cases. Of course, many of the very severe cases die before eye complications set in.

Dr. Greear mentioned conjunctival hemorrhage, which I think most observers mention. We had no subconjunctival hemorrhage nor anything of that sort, and we really had no conjunctivitis.

Endophthalmitis certainly does accompany some very mild cases of meningitis, and as Dr. Pfingst mentioned, patients may come into the clinic simply for the endophthalmitis, who do not know they have meningitis. When we see a case of endophthalmitis we think that possibly it may have been due to mild meningitis which has spontaneously recovered.

In regard to the fact that optic neuritis occurred more frequently in other epidemics than in ours, Randolph pointed out in 1893 that different epidemics have different eye characteristics. Our most striking complication was the endophthalmitis. Other observers have reported the main complications as conjunctivitis and optic neuritis.

I list these cases as simple hyperemia of the disc: I would not class them as papillitis. There was no elevation of the disc; it merely looked redder than normal. The fundus was not entirely normal, but it could not be classed as a definite neuritis. The case that died did not show a typical choked disc. He had three or four diopters of swelling as nearly as we could measure. He had not a pronounced choked disc, but a marked optic neuritis. In most of these cases we were unable to take the fields or the blind spot until they were well on the way to recovery, so we did not make any observations on this point until after the patients had left the hospital, and I did not take that up at all in this paper.

Dr. Woodward asked about the complications of the eighth nerve. In the whole series there were 6 patients who had complete bilateral deafness, and there were 6 who had unilateral deafness, all of which were total.

I was asked about the precautions against contagion. We always used cap and gown and mask. Everyone who came into the hospital put these on. Except for that we took only the ordinary sanitary precautions. We did not use sprays and gargles. There did not seem to be much relation between the persons exposed to meningitis and those who developed it. I do not believe that any of the nurses and doctors who were on the staff of the Isolation hospital, and who worked with these cases night and day, developed the disease. People who were not exposed at all developed it. Sporadic cases occurred in persons who apparently had no contact at all with the disease.

THREE TYPES OF ANEMIA*

By J. H. MUSSER, M.D.,
New Orleans, La.

The three patients presented here show alterations in the blood picture, anemias of three different types which vary considerably in their etiology.

Case 1.—This patient has pernicious anemia, rather a hackneyed subject just at present. We are all more or less pernicious anemia conscious since we have a specific for this disease. Several features in this case deserve emphasis.

The man is 54 years old. His illness began approximately six years ago, at which time he was very sick. He had dyspnea and vertigo, symptoms which occur in any anemia. He had a sore mouth and tongue, a symptom, glossitis, which is frequently found in pernicious anemia, and of considerable importance in the diagnosis of some of the questionable cases. He had diarrhea. This may be a symptom of pernicious anemia or of anemia in general. He had numbness, particularly in the extremities. Here we have the evidence of the beginning cord changes, neurologic evidence of pernicious anemia. He had yellowish discoloration of the skin, an evidence of the increased hemolysis that is present in Addison's anemia. Despite our present day idea as to the etiology of the disease, that it depends upon the absence of something in the gastric secretions which is necessary to liberate red blood cells from the bone marrow, excessive hemolysis is part of the disturbed physiology of the disease. He had insomnia and tremor of the lower extremities, symptoms again of any anemia.

He went to the Mayo Clinic, where his case was diagnosed as pernicious anemia. He states that he was put on liver diet, but the condition grew worse for a time. Later he began to improve. After two years of rather haphazard treatment he began to change for the better, and until July, 1930, he was in fairly good condition. In July the symptoms reappeared and he was admitted to the Louisville City Hospital.

I think you can recognize even in the back of the room the marked yellowish pallor of this patient. When he was admitted to the hospital he complained of weakness, inability to walk, anorexia, diarrhea, paresthesias of the lower extremities and loss of weight. He fulfilled most of the diagnostic features of the disease, but marked loss of weight is contrary to the usual finding in pernicious anemia. The patients are usually fat and well nourished individuals.

When he was admitted to the hospital he showed dental caries. He had a positive Romberg and his blood pressure was 94/60. Note the inability to walk, the positive Romberg, and, another important finding in this case, absence of tuning fork vibration over the lower extremities and sluggish knee jerks. In addition to anemia, then, this man shows well marked cord symptoms.

When he was admitted to the hospital on April 22, 1930, the red blood count was 910,000, the white count low, hemoglobin 22 per cent, giving a high color index. Because of the difficulty in estimating hemoglobin we do not lay so much stress on the high color index. Hemoglobin estimations are not standardized and vary greatly.

On May 3 he was placed on liver extract, three bottles a day. On May 7, the blood count was 1,820,000, with hemoglobin 24 per cent. On May 30 it had gone down to 1,060,000. He was then placed on ventriculin and immediately improved. The improvement was not the usual spectacular result we get with liver extract. He improved objectively, but did not feel much better subjectively. Then for some peculiar reason he quickly showed improvement when placed upon Valentine's beef juice and liver extract preparation. Very probably he was ready to improve at that time and if placed upon Lilly's preparation of liver extract the result would have been just the same. The condition of the blood showed marked improvement. The discharge note was that he was then markedly improved, his appetite was good, he showed little weakness and walked well.

In spite of his positive Romberg, the Wassermann reaction was negative on both blood and final fluid.

Here is a man who has improved to a certain extent on the use of liver extract, but who did not show a particularly rapid improvement. Gradually, however, the improvement occurred, and now he is up and about. I think the particular interest in this case is the fact that his cord symptoms have improved. Bear in mind that last spring he was not able to walk and now I will ask him to walk across the stage to show you that he walks fairly well. He is a little shaky, but we would not call it a positive Romberg at this time. His reflexes are about the same as before. I do not know whether his vibration sense has improved, but his paresthesias are considerably better. All is interesting because of the fact that we hear very divergent reports concerning the efficacy of liver and liver extract in the treatment of the cord symptoms of pernicious anemia. You remember that Minot, in some of his early papers, said that his treatment had no effect on cord symptoms. Later he changed his mind. It so happens that I have seen patients who have improved markedly, as this man has, and others who have not shown much improvement. I think there often is a temporary improvement, but the cord symptoms return and the patient ultimately expires, largely because of the cord involvement.

I have two other patients that I wish to present for just a moment.

Case 2.—This young man also had anemia, from a cause different from that which I have already discussed. He presented as his chief symptom enlargement of the spleen and a secondary anemia, a macrocytic type rather than a microcytic type. He had no hemorrhages, but had a large spleen and the anemia and on this basis a diagnosis was made of splenic anemia. The pathologic diagnosis confirmed the fact that he had Banti's disease. He has improved greatly since the spleen was removed and now feels better than he ever

*Clinic, General Clinical Session, Southern Medical Association, Twenty-Fourth Annual Meeting, Louisville, Kentucky, November 11-14, 1930.

did before, according to his story. As you can see, he presents a good healthy appearance.

Case 3.—This small boy is 15 years of age. He came into the hospital with swelling of the right pectoral region, which gradually increased. Physical examination showed nothing of importance except the presence of a tumor mass in the right pectoral region. It was movable, well encapsulated, not tender to pressure, and the laboratory findings showed but little. X-ray examination shadowed no evidence of involvement of the lung, but the root shadows were increased in density.

He still has lymph node enlargement and the diagnosis, as happens so frequently with these patients who have enlargement of the lymph nodes, has to be made largely by the pathologist. We could suspect the possibility of tuberculous lymph nodes. A host of things could be suspected, but the most typical and most plausible thing is tuberculous lymph adenitis.

This boy when he first came into the hospital had a red blood count of 5,600,000, a total white count of 16,000. Dr. Osler, in his magnificent textbook, describes beautifully the development of the anemia of the Hodgkins disease in these patients. He mentions the enlargement of the nodes and says, "and then the anemia begins." That is what happens so often with these poor people. The diagnosis is made, they get along reasonably well, and then the anemia begins. Incidentally, in confirmation of the clinical diagnosis, pathological examination revealed typical Dorothy Reed cells in both specimens that were removed at biopsy.

On the eleventh of this month his blood count was 4,260,000 and the hemoglobin had come up slightly. The white count was down to about 6,000. He showed a large percentage of lymphocytes, 60 per cent; polymorphonuclears, 40 per cent; no eosinophils.

He has had roentgentherapy and improved splendidly, but, unfortunately, we cannot say the improvement will persist over a great period of time. The well known action of the x-rays on the lymph nodes is so well understood that it need not be emphasized, but the basic process progresses in these cases, and then the anemia begins, and the patients retrogress.

ANEMIA OF THE NEWBORN*

By PHILIP F. BARBOUR, M.D.,
Louisville, Ky.

There is probably more study of the blood in recent years than of any other system in the body. There are so many unsolved problems in connection with the blood that the physiologist, the clinician, and the research worker are stimulated to further investigation. Among the unsolved problems is the mechanism of blood production in the embryo. The relation of the blood of the mother to that of the newborn has been the subject of research work in the Department of Pediatrics in the University of Louisville. The occurrence of anemia in several newborn babies raised the question of the causation.

It is agreed that the red blood cells are formed in the bone marrow principally, but in the embryo the liver and the spleen are also sources of red blood cell formation. In the early months of infancy the liver and spleen gradually lose their property of such cell formation and the bone marrow becomes the active and only center of production. In marked anemia occurring very early, there is probably a re-assumption of this property of these organs.

There are three elements in the red blood cell, the stroma or the cell body itself, the hemoglobin, and the lecithin and the cholesterol, which may constitute as much as 30 per cent of the dried weight of the cell.

The red blood cells seem to originate in certain endothelial cells in the so-called sinuses of the bone marrow, or somewhat similar spaces in the liver and spleen. The endothelial cell must pass through several steps in its evolution. It must break up the attachment to other cells or to the basement membrane and become free in the blood. It must get rid of the nucleus. (Schilling advances the theory that these separated nuclei become the blood platelets, but this is not as yet generally accepted.) The cell must pick up the hemoglobin and fix it in some unknown loose combination with the stroma. The method of incorporation of the lecithin and cholesterin is unknown. The red blood cell as thus constituted is ready to function as an oxygen carrier, but it will have other distinguishing peculiarities in its ability to take up certain alkalies and reject others, and to play very important physiologic parts in acidosis and alkalosis. It must absorb and discharge gases and there are other less well known functions.

The best recognized stimulant of the formation of the red blood cells is an active hemorrhage. When the hemorrhage is not excessive, the response of the red bone marrow is adequate and new normal cells are soon elaborated in sufficient quantities to correct the anemia. If the hemorrhage is too large the demand for red blood cells is exorbitant and beyond the normal ability of the bone marrow to respond, so that many immature cells are thrown into circulation: cells still containing nuclei, the normoblasts, cells irregularly and inadequately equipped with hemoglobin, showing polychromasia, cells of irregular sizes and misshapen cells with a stroma imperfectly formed and showing reticulation. In explaining this response to hemorrhage the most plausible theory is the presence

*Clinic, General Clinical Session, Southern Medical Association, Twenty-Fourth Annual Meeting, Louisville, Kentucky, November 11-14, 1930.

of some hormone which is carried in the blood to the bone marrow. The theory of innervation of the sinuses is hardly tenable. It is thought that this hormone is developed in the liver. At any rate there can be elaborated from the liver a soluble organic compound, with at least one ring nucleus containing nitrogen which seems to be capable of increasing the red cell formation.

On the other hand, there is much evidence to show that a hormone may be manufactured by the spleen that has direct inhibitory action upon the formation of the red blood cells and the platelets. The very pertinent question then arises of how far the red blood cell of the embryo depends upon the mother's blood formation, or whether it develops by natural cell division independent of the mother's blood, or whether hormones from the mother act upon the fetal blood forming organs.

As to the matter of the passage of these undetermined hormones through the placental membrane we have no direct evidence. The newly elaborated test of pregnancy by the injection of urine from the pregnant mother into the veins of a rabbit that has not previously menstruated, and the prompt institution of menstruation in that rabbit, is believed to be a hormone phenomenon. It is a curious fact that this hormone-containing urine filtered through a Berkefeld filter loses that property. In other words, the hormone will not pass through such an intact membrane. It seems to be settled that red blood cells themselves cannot penetrate the placental membrane and must, therefore, be formed in the fetus. Unquestionably, however, the iron of the hemoglobin must come from the mother, as there is no other source. The synthesis of the hemoglobin must take place in the embryo, and probably also the synthesis of the lecithin and the cholesterin.

The Pediatric Department of the University of Louisville, with the assistance of Dr. F. L. Fletcher, has made a study of the blood of about 120 women and their newborn babies to learn whether there is any necessary relation between the mother's and baby's blood; or, in other words, given a certain red blood cell count and hemoglobin percentage in the mother, could any guess be made as to their amounts in the baby?

We have discovered no fixed ratio, though as a rule the hemoglobin per cent was higher in the baby and occasionally reached 100 per cent on the Tallquist scale. The variation at times was as great as 35 points, and in spite of a mild anemia in the mother. The fetus having demanded and secured the iron from the mother's blood, must retain it, because there are no real avenues of escape for iron except the very small amount in the meconium, or urine. The red cells also varied greatly and the highest counts far exceeded those of the mother. In the several cases of twins, whether uni- or bi-oval, there was no uniformity in the blood picture, though the hemoglobin seemed to be more nearly the same per cent.

In 9 babies the blood counts were notably lower than in the mothers, in hemoglobin, red blood cells, or both. Several babies presented the blood picture of a severe anemia, the hemoglobin going as low as 30 and the red blood cells below 2,000,000.

A special study was made of these 9 mothers. Only one was syphilitic, the Wassermann being four plus. The others were average healthy women with nothing unusual in their histories or blood pictures. Syphilis must always act to lower the red count. More detailed study of such cases is needed. Syphilitic babies with large livers and spleens should throw some light on this problem, especially as the bone marrow is not usually involved early in hereditary syphilis. The fact that hereditary syphilis has a predilection for the endothelial lining of the blood vessels which are producing the red cell would help explain the anemia which does occur in syphilitic children, but in this case it is the child which fails to produce the red blood cells on account of the location of the luetic lesion.

Although we have been unable to establish any relationship in the blood picture, the prenatal care of the mother should certainly embrace the blood condition as well as correct as far as possible all dyscrasias of the mother.

The treatment of anemia in the newborn is a rather hopeless measure, especially treatment of the aplastic type. Blood transfusion usually serves only as a temporary help and can only mitigate without curing the basic deficiency. Time is a factor just as it is in prematurity. Frequent small transfusions are likely to be more helpful than a large quantity of blood at one time. Some form of absorbable iron is certainly indicated, and also other preparations which contain iron, such as beef liver, or oysters. There is also some advantage from copper and other metallic salts, but they cannot as yet be properly evaluated.

A CLINICAL OBSERVATION OF NUTRITIONAL INJURIES IN INFANTS*

By HUGH LESLIE MOORE, A.B., M.D., F.A.C.P., Dallas, Texas

Realizing that 85 per cent of infants needing medical care are treated by the family physician, it is my desire to present to this wonderful army of men throughout the South, one practical point in the feeding of infants suffering from the more serious nutritional disturbances. I have selected this subject because of its serious consequences, also because of the frequency with which it occurs and the promptness with which it can be overcome if it is properly managed. It has been my privilege for a number of years to treat a large number of infants having pyloric stenosis, many of whom on admission had reached an advanced stage of starvation. The baby survived the surgical operation without difficulty, but we found ourselves confronted with the far more serious matter of overcoming a nutritional injury of a marked degree.

The feeding methods ordinarily in vogue for postoperative cases fail to produce the proper growth and development, even when the child has a good appetite, and there is an adequate intake of food properly proportioned. Because of a serious disturbance of metabolism a moderate diarrhea results. The stools average from three to six daily, and are of a semi-pasty consistency with a definite water loss. There is a prompt improvement of digestion and cessation of water loss with a consequent gain in weight when the infants are placed on thick cereal feedings, such as are used in non-operated cases. I therefore tried a similar method of feeding in nutritional injuries following a prolonged illness from any type of infection: such as pyelitis, otitis, mastoiditis, chronic infections of the respiratory tract, the sequelae of infectious diarrheas and also in premature infants whose weight became stationary. Following these infections a nutritional injury frequently develops as the result of a general metabolic disturbance. Such infants usually have a good appetite, and take a sufficient quantity of food, yet their weight remains stationary or a graduate loss results. The stools are a little too frequent and show an appreciable water loss. They have not the appearance nor the frequency of a fermentative diarrhea. The high protein, low carbohydrate and low fat diet used in fermentative diarrhea is of no value, for the frequent stools and the loss of weight continue. Reversing the formula to a high carbohydrate with a low protein and a low fat, the results are equally ineffectual. Using lactic acid milk brings no improvement in the stools, nor does it check the downward weight curve. Such cases should be placed on a feeding formula consisting of twenty ounces of skimmed milk mixed with twenty ounces of water. Boil the milk and while boiling, stir in one tablespoonful of raw cream of wheat at a time until four are added. Then place the whole amount in a double boiler and cook two hours. One tablespoon of cane sugar is then added to make it more palatable. According to the recent work of Gerstley, the sugar also renders the food more absorbable in the intestinal tract and consequently more completely assimilated. Within twenty-four hours on this formula, the water loss has practically disappeared, and the stools have become more pasty with a granular appearance exactly as though the cream of wheat were passing through unchanged. At the same time, the loss in weight has been checked. In the next twenty-four hours the stools become smooth and pasty with no water loss. The weight shows an increase and continues on an upward curve provided there is a gradual increase of the milk and a corresponding decrease in water and, above all, a gradual increase of sugar in the form of malt or milk sugar. Maintaining the water balance by giving fluids either by clysis or intraperitoneally is of vital importance to the success of the above plan.

This simple measure has been of inestimable value to me both in private and hospital work and I trust you will find it equally so in the correction of the serious nutritional injuries of infants.

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*From the Department of Pediatrics, Baylor University College of Medicine, Dallas, Texas.

CANCER OF THE STOMACH IN THE SOUTHERN NEGRO: A STUDY OF FIFTY CASES*†

By JOHN B. FITTS, M.D.,
Atlanta, Ga.

The medical wards of any general hospital present two types of cases that are as baffling now as they were twenty years ago. Despite refinements in diagnosis and in therapy, the advanced hypertensive patient with the irremediable pathologic changes in vascular, cardiac and renal systems, and the cases of malignant visceral disease with hopeless outlook still persist. In the case of the hypertensive, one must accept the impression of progressive pathological changes, in the development of which, a period of ten or fifteen years perhaps has passed. In the malignant case the picture is more markedly finished, but has its beginning twelve or twenty-four months previously.

Some eighteen years ago I heard an alert abdominal surgeon say in a lecture to a class of senior medical students: "Gentlemen, when it comes to cancer of the stomach, I hold up my hands." This note of pessimism then was somewhat excusable. I wonder if his attitude would be less dramatic now. Experience has shown that early gastric cancer is one of the most insidious of diseases and that there are no absolute pathognomonic symptoms of the early case.

In our efforts to differentiate the functional from the organic disease in the gastro-intestinal tract, do we not too often use as a criterion the old classical triad of pain, vomiting and wasting, the red lights of advanced malignancy?

This problem rests upon the combined efforts of the general practitioner, the internist and the surgeon. Early diagnosis will depend upon early suspicion, a check and recheck of findings, a close surveillance and the use of early exploratory laparotomy when warranted.

Thirty-eight per cent of all cancer occurs in the stomach. The minute study of individual cases and of facts gleaned from series of cases helps to emphasize facts which we already know and may help to establish some new method of approach.

Some eight years ago I presented before this section a study of fifty cases of gastric cancer in white persons. In the present series I have reviewed fifty cases that we have had in the negro, occurring in the medical wards of a teaching hospital. These cases represent the incidence of the disease among 40,000 general hospital admissions over an eight year period.

Hoffman believes the increase in gastric cancer in the negro to be as real as it is in the white race. His statistics from 1900 to 1910 give the male rate under 50, and female rate under 40; both greater than in the white race.

It is doubtful that hospital admission rates give an accurate idea of the occurrence of the disease in the general population.

In this series the sex incidence was males 39, females 11; in the white series, males 35, females 15; a close parallel.

Age by Decades.—The incidence between 20 and 30, in the colored series is none, in the white 1; between 30 and 40 years, in the colored 16, in the white 17. Both series here show the greatest incidence in the fourth decade. Between 50 and 60, in the colored it is 13, in the white 14; between 70 and 80, colored 1, white 1. In both groups there runs a parallel till the sixth decade is reached, when the white cases exceed the colored.

Occupation.—In the series of 50 white cases, 33 per cent were farmers. This is the occupational rate of Smithies's series of 921 cases. In the South the occupation of the negro is largely manual labor, of course, and the occupations are found in that group. This group is confined to the urban type only.

Heredity.—In the white series, 4 cases gave a history of familial malignancy; in the colored series, 1. This, of course, may mean nothing, as the obtaining of an authentic family history in this race is next to impossible. It might mean, however, that the cancer incidence in former decades was less.

Diet and Nutritional Factors.—The diet of the Southern negro has some points peculiarly its own. In general, his dietetic errors might be expected to be an accentuation of those of the whites for two reasons: first, his food is chosen entirely by the caprice of appetite; second, for economic reasons variety and balance are extremely limited. His diet is largely made up of white flour and cornmeal, pork, boiled turnip greens and cabbage, sugar and syrup. His diet is totally lacking in fruits, leafy vegetables, milk and eggs and is excessive in the starches, sugars, and fat meats. One of the results of this type of diet is a hopeless dental condition. He has cavities and abscessed teeth and diseased gums,

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†From the Medical Department of Emory University School of Medicine.

leading to focal infection and insufficient dentition. Metabolic defects coming out of this background are to be expected.

The onset of initial symptoms varied from two months to two years, the average time being four months. This refers to onset and marked symptoms. The negro will ignore slightly disturbing digestive symptoms and seeks advice only for those symptoms which incapacitate.

The main presenting symptoms were pain, vomiting, weight and strength loss; in other words, the late and incapacitating symptoms of the disease. Seventy-six per cent of this series complained of pain. In the white series, there were 44 per cent, showing that here symptoms other than pain led the patients to seek examination. One case in this latter series with involvement of the pars media of the stomach I saw go to his death without pain or vomiting.

In the negro series, 58 per cent vomited; in the white only 16 per cent. The discrepancy of this symptom in the two series is due to the greater number of pyloric obstructive types.

Palpable tumor was present in the negro series in 54 per cent; in the white, in 34 per cent. More advanced types are found in the negro.

Gastric Analysis.—In the negro series hydrochloric acid was present in only 23 per cent of the cases and absent in 77 per cent. In the white series, hydrochloric acid was present in 50 per cent (this latter finding parallels the hydrochloric acid content in series studied by other observers). Normal acidities were found in a number of cases and in 16 per cent of the white series where hyperchlorhydria existed. In regard to the 77 per cent of achlorhydria in the negro series it has been my observation in general that achlorhydria is found in the clinic and ward negro cases more frequently than in the white. Two factors may be etiological: marked dental defects and high incidence of syphilis.

Hematemesis occurred in about 20 per cent of the cases and occult fecal bleeding in 60 per cent. Occult bleeding occurred in only 26 per cent of the whites.

Hemoglobin percentages ran from 25 to 80 in both series, with an average lower rate in the negro cases.

Wassermann Reaction.—There were 28 per cent positive Wassermanns in the negro series. We find a 30 per cent positive rate of all specimens submitted to the laboratory from all services of the hospital.

A negative serological reaction means little in this type of clinical material. We believe that the clinical and latent incidence of lues is tremendously high in the colored race. These luetics, of course, can develop malignant disease. Therefore discrimination between gastric lues and carcinoma must be kept in mind, there being many points of similarity between the two. A year or so ago I found 8 cases of definite gastric syphilis occurring among 35,000 general hospital admissions over an eight-year period. In the same period there occurred about forty gastric malignancies. Gastric lues is a very infrequent disease and while its incidence appears small when considered in the light of 35,000 general hospital admissions, it is a large series when compared to the malignant series. In the white race the ratio would be infinitely less. I do not know that the comparative ratios have been brought out in the literature.

Our cases of gastric syphilis showed marked weight loss, pain, vomiting, anemia, positive occult bleeding and anemia: many suggestive features of advanced malignancy.

The therapeutic test in this condition must be often used as the luetic cases quickly respond to antiluetic treatment.

Operative Findings.—Thirteen of this series came to operation and gastro-enterostomy was the operation of choice. Of the thirteen cases, twelve died. Thirty were not operated upon either because of inoperability or because they refused to submit to operation.

Of the non-operated, 21 died and 9 were discharged with the final termination unknown.

In 20 per cent of the cases pathological studies were made. The majority of cases showed metastases.

The outlook of gastric cancer in the colored race is gloomy for obvious reasons; mainly because the negro's psychological make-up is such that he will ignore mild digestive symptoms and will seek medical advice only when such marked symptoms as vomiting, pain and weakness incapacitate him.

SUMMARY

(1) Fifty cases of gastric cancer in the Southern negro are studied, and the findings compared with 50 cases in whites previously reported.

(2) The negro cases are later types than the white.

(3) Gastric lues occurs more often in the negro and closely simulates carcinoma.

(4) Dietetic errors are more pronounced in the negro series.

(5) Absence of hydrochloric acid is noted more frequently.

(6) Hope of early diagnosis is very remote.

MAMMARY CANCER*

By CHARLES A. VANCE, A.M., M.D., F.A.C.S., Lexington, Ky.

It is not to be expected that I can give you anything new concerning cancer. However, as the subject is always of keen interest to surgeons, a brief review of certain phases of this mysterious disease, together with a few reminders, may be appropriate on this occasion. The term "cancer," as here used, is intended to include all malignant neoplasms, whether of "epithelial, endothelial, or connective tissue origin."

We are all familiar with the fact that cancer is one of the most ancient of human ailments. The Papyrus Ebers (1550 B. C.) is said to contain an accurate description of the disease. Cancer is mentioned in early Egyptian and Indian literature. Unmistakable evidence of malignant disease was found in an ancient Egyptian mummy.

There was a time when cancer was known as "the mysterious disease," or "the disease of mystery," a name which might still be aptly applied, since "it has been a constant subject of study in all ages and in all nations, but the mystery of its origin is yet unsolved" (McGuire). "Cancer sits silently through the ages like the Sphinx on the Nile, the supreme mystery of all times. There is no more mysterious nor mortal disease afflicting the human race than this insidious malady" (Anderson).

The primary etiological factor in cancer still remains submerged in obscurity. Pathologic studies have resulted in discovery and description of a large number and variety of so-called "cancer cells," but have shed no light on the etiology. The disease appears to be neither infectious, contagious nor hereditary.

Cancer has been divided, subdivided and classified into numerous types and groups, on the basis of its clinical characteristics, rapidity of growth, degree of malignancy, character of cells, and so forth, but little information of value to the patient has been obtained. Knowledge concerning the origin of cancer has not increased very much since the days of our Indian, Egyptian and Grecian professional forefathers.

Aside from anatomic location, mammary cancer differs in little respect from malignant neoplasms elsewhere. Since the breast is largely a glandular organ, adenocarcinoma is the type of mammary malignancy most frequently observed. In incidence breast cancer ranks third, being exceeded only by the uterus and gastrointestinal tract. Cancer of the male breast occurs occasionally and pursues about the same course as in the female.

Especial attention is called to a rare form of mammary cancer, the acute or so-called inflammatory type, which is a soft, rapidly growing, very malignant tumor with early general metastases and fatal outcome within a short time. The acute type is said to occur in slightly more than 1 per cent of cases of mammary malignancy. According to Fox, Lee was able to find record of only one hundred cases in the literature. Three cases of acute or inflammatory breast cancer were recently reported by Fox. Two patients were subjected to early radical operation, one was not operated upon; all died from "local and general metastases" within a few months after discovery of the lesion. Progress is so rapid as to suggest abscess formation. From the beginning the skin is markedly inflamed and purplish-red in color. Pain is an early symptom. Bell (quoted by Fox) in 1841 said, "when a purple color is on the skin over the tumor accompanied by pain, it is a very, very unpropitious beginning." The mortality in such cases is practically 100 per cent.

It has been shown that malignant disease has gradually increased in incidence during the past few years, yet the mortality from mammary cancer has decreased. The latter has been made possible by earlier diagnosis and more prompt radical operation.

In the educational campaign against cancer that has been in progress for the last decade, and for which our own Dr. Bloodgood is largely responsible, an attempt has been made to teach the public several important things: first, to recognize the early signs of cancer; second, the necessity of having a physician make a careful examination when the first sign appears; and third, that immediate surgical treatment should be instituted when anything resembling a tumor is discovered in the breast, whether malignancy is suspected or not.

When the physician detects a nodule in the breast, his duty to the patient demands that she be referred at once to the surgeon for further investigation; (a) to ascertain whether the lesion is benign or malignant, and (b) to determine the method of treatment most appropriate in that particular case. It is feared that the general practitioner has too often advised the patient to wait a few months and see what happens!

When the patient herself notes any irregularity in contour or any enlargement of her breast,

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she should consult her physician immediately. Of course, she will do so if she has any pain, but this is not often an early symptom.

While much good has resulted from the educational campaign, its purpose has not been entirely fulfilled. In approximately 60 per cent of cases glandular metastasis has occurred when the patient reaches the surgeon. The public does not seem yet to understand that pain is not, as a rule, an early symptom of mammary cancer and women are prone to delay seeking medical advice so long as nothing hurts them. This is an unfortunate state of affairs for which the only remedy is further education. The public must be made to appreciate the fact that the greatest danger in cancer is procrastination, that early diagnosis and treatment are the most important considerations in solution of the cancer problem.

The importance of the so-called age limit in mammary cancer has been unwisely emphasized. The former teaching, in substance, was that cancer never developed in a breast which had not lactated, nor in a woman less than thirty years old. We now know that these opinions were incorrect. There seems no valid reason why breast cancer may not occur at any age, and cases have been reported in girls less than thirteen years old who had neither "menstruated, copulated nor lactated."

Mammary cancer in youthful subjects has existed unrecognized for considerable periods because of the presumed influence of the age limit. Valuable time and the golden opportunity were thus forever lost to the patient. The fault here generally lies with the physician who says, "It cannot be cancer, the girl is too young." Delay in completing the diagnosis by excision or biopsy and pathological examination has no doubt been responsible for many fatalities from mammary cancer. There being no definite age limit in cancer, this term should be discarded.

The axiom that every tumor of the breast, regardless of the age of the individual, must be considered malignant until proven benign, should be thoroughly instilled into not only the laity, but also physicians. As surgeons it is our duty to preach and emphasize this doctrine.

The public has become familiar with the meaning of the term precancerous lesion or precancerous stage as used by physicians. At best the term is not only doubtfully correct, but misleading, since no one can possibly predetermine whether a proven benign lesion will ever undergo malignant transformation. The public understands this, and women refuse treatment so long as the lesion is pronounced benign or precancerous. It is useless to say that, despite our education and wisdom and experience, we cannot differentiate between benign and malignant tumors of the breast, in their early stages, based upon the clinical findings alone. Simply to inform the patient that she has a precancerous lesion of the breast seems unwise. She is likely to conclude that nothing need be done. Why not substitute "potentially malignant" for "precancerous?" The patient would then probably recognize the necessity for further investigation and treatment.

The fact should be impressed upon the public as well as physicians that the diagnosis of mammary cancer in its early stages can be made only by pathological examination of tissue obtained by either excision or biopsy. After development of the classical textbook symptoms, the diagnosis is apparent, but it is then usually too late to benefit the patient by operation or any other treatment.

When Halsted devised the procedure known as the radical operation, it was believed the treatment of mammary cancer would soon become completely standardized, but this did not eventuate and some difference of opinion still exists regarding technical details, the amount of tissue to be removed, and so forth. However, the general plan of Halsted is followed by the majority of surgeons in performing radical operation. Both pectoral muscles are divided at their insertion, the axilla is dissected free of glandular tissue and fat, dissection of the pectoral muscles is continued downward to the ribs and as much of the fascia as possible is removed. This enables one to remove the breast and attached structures in one mass. The axilla is usually drained through a stab wound, the skin incision being tightly closed.

There is yet no consensus of opinion in regard to either preoperative or postoperative Roentgen ray therapy. Personally, I agree with those who believe the x-ray is beneficial when used both before and after radical operation. Radium application is not so frequently used, but is highly regarded and recommended by many. Some think this is the best method of giving postoperative irradiation.

Lee reports several cases of mammary cancer treated by irradiation alone, and similar reports have been made from time to time by other authors.

The cautery (hot stone) was used by the ancients in treating cancer. The same principle in a more refined form is being applied today,

and there have been devised quite a number of special instruments for use in so-called electro-surgery. High frequency currents for desiccation, fulguration, electric cutting, electrocoagulation have been employed by many surgeons for a number of years.

"Throughout the centuries many types of cancer treatment have come, stayed with us for a while, and disappeared from the current annals of medical history. Each medical era has usually had a revival of one or more therapeutic methods, but the majority of them have ceased to be after a brief trial. It is only that branch of medicine which treats disease, wholly or in part, by manual and operative procedures, surgery, which in the control of cancer has stood the test of time" (Bainbridge).

In every case of mammary cancer, a careful Roentgen ray examination should be made of the chest and long bones to determine whether metastases have occurred. In some cases metastases occur early in the course of the disease.

"Radical operation is never justifiable unless the diagnosis of malignancy has been made, and the safest method of establishing a definite diagnosis is removal of the neoplasm by wide excision for immediate microscopic diagnosis and operation if the tissue proves malignant" (Harrington).

The prognosis in mammary cancer depends on the length of time the disease has existed when the patient comes to operation, the thoroughness of the operative procedure, and perhaps, the virulence of the disease.

If the diagnosis is made prior to the occurrence of glandular or other metastasis, and radical operation is performed at once there should be no deaths, and no recurrences. This idea may seem Utopian, but in these days of progress such results are within the limits of possibility.

In conclusion let me urge that we as surgeons do everything possible to educate women of the country to seek the advice of the surgeon when there is anything wrong with their breasts, that we also educate general practitioners who first see many of these patients, urging them not to advise waiting a few months to see what happens (we know what happens in many, many cases), but to send these patients to the surgeon for excision of breast nodules and examination by the pathologist. If the tissue is found malignant radical operation should be performed immediately. Each of us as surgeons should carefully examine ourselves, removing the mote from our own eye, if it be there, and always be sure that we do not postpone a radical operation if it should be performed at once.

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ODYSSEY OF OBSTETRICS*

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The "Odyssey," an epic poem ascribed to Homer, describes the ten years' wanderings and adventures of Ulysses in returning home to Ithaca after the siege of Troy.

Webster defines, figuratively, "Odyssey" as a long wandering and series of travels.

It has seemed to me that my Chairman's Address might properly be an account of the long wanderings and series of travels of adventure and misadventure which have attended the development of the art and practice of obstetrics.

St. John, The Divine, described four horsemen for his Apocalypse. Similarly, four horsemen have ridden on to death and destruction with the pregnant and parturient woman. These four horsemen are:

Sepsis
Hemorrhage
The toxemias
Deformities and malpositions.

The subject is extremely broad, and "our art is long and time is fleeting," and my presentation of the "Odyssey of Obstetrics" will be confined to and grouped around these four horsemen and the heroic efforts which have been made from the beginning to unhorse these riders of mortality and morbidity in childbirth.

Doubtless, St. John's horsemen had a captain. Our obstetrical horsemen have a captain, and that captain is horseman sepsis.

In a study of the early history of medicine, one of the most striking and pathetic pictures is the blind groping in Stygian darkness for ways and means to prevent sepsis. From the very be-

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ginning there were momentary flashes of light, but prejudice and jealousy extinguished the feeble flame. Hippocrates, himself an obstetrician, to combat sepsis advised the use of mare's milk boiled twice and strained, and recommended rain water boiled twice for washing the hands.

Until the Seventeenth Century, sepsis was thought to be caused by suppression of the lochia. In the Seventeenth Century, Puzos originated the theory that sepsis was caused by milk metastasis. Later, German and English observers suggested that inflammations of the uterus and perineum caused puerperal infections.

Garrison says "perhaps the worst phase of Renaissance medical practice was that of obstetrics." In normal labor, a woman had an even chance if she did not succumb to puerperal fever or eclampsia. In a difficult labor, she was usually butchered to death, if attended by a Sairey Gamp of the time, or one of the vagabond surgeons.

As Hirst points out, it is astonishing how distinctly modern are present day views of the etiology and treatment of puerperal sepsis. The earliest beginning was much less than one hundred years ago, and it may be truthfully said that in the last fifty years more progress has been made than in all previous time. There is a tremendous gap between Hippocrates and Puzos on the one hand and Gordon, Semmelweiss, Charley White, Denman and Oliver Wendell Holmes on the other hand.

Priority in the true etiology of puerperal sepsis has been much discussed and the discussion at times has been bitter and acrimonious.

After a careful and extensive study of the literature, I am convinced that Alexander Gordon of Aberdeen first clearly demonstrated the infectious nature of puerperal sepsis. Gordon published his "Treatise on the Epidemic Puerperal Fever" in 1795. Thoms of New Haven (*American Journal of Obstetrics and Gynecology*, February, 1928) writes most interestingly and convincingly of "Gordon of Aberdeen." In addition to broadcasting his views of the infectious nature of the condition, Gordon presented very definite ideas of pathology. From many personal dissections he proved that the uterus, its adnexa and the peritoneum were the organs mainly involved, and his advice as to prophylaxis indicated a lucid idea of the disease.

I would not for a single moment detract from the monumental service rendered by our own Oliver Wendell Holmes in this connection. But it must be remembered that Gordon's work antedated Holmes' by a half century. Holmes in his essay on the subject, published in 1843, was pleased to pay high tribute to Gordon.

The wealth of Holmes' service was concerned largely with his magic pen. He was a master of the Queen's English and literally burned the truth into the minds of his fellows.

The closing sentences of his first paper are a ringing call to faithfulness and conscientious performance of duty to obstetricians of all time.

"It is as a lesson rather than as a reproach that I call up the memory of these irreparable errors and wrongs. No tongue can tell the heart breaking calamity they have caused; they have closed the eyes just opening on a new world of love and happiness; they have bowed the strength of manhood into the dust; they have cast the helplessness of infancy into the stranger's arms, or bequeathed it with less cruelty, the death of its dying parent. There is no tone deep enough for regret and no voice loud enough for warning. The woman about to become a mother, or with her new born infant on her bosom should be the object of trembling care and sympathy wherever she bears her tender burden, or stretches her aching limbs. The very outcast of the street has pity on her sister in degradation when the seal of promised maternity is impressed on her. The remorseless vengeance of the law brought down on its victim by a machinery as sure as destiny is arrested in its fall by a word which reveals her transient claim for mercy. The solemn prayer of the liturgy singles out her sorrow from the multiplied trials of life to plead for her in the hour of peril. God forbid that any member of the profession to which she trusts her life, doubly precious at the moment, should hazard it negligently, unadvisedly or selfishly."

There was abundant need for this stirring appeal from Holmes. Hodge and Meigs, leading obstetricians of the day, inveighed against his teaching with brilliant satire and ponderous invective.

While Holmes was doing his monumental work in America, Ignaz Philip Semmelweiss, a young assistant in the Maternity Ward of the General Hospital of Vienna, became convinced clinically of the infectiousness of puerperal fever and thundered an order that no student should examine a woman in labor without having washed his hands in chlorine water. As related by Hirst, Semmelweiss, recognizing the transcendent importance of his teaching, preached the new doctrine in season and out of season. But, like Holmes, in America, he got only abuse and ridicule for his pains. He had a sensitive shrinking nature, and finally lost his mind entirely, dying in a lunatic asylum.

Obstetrics owes much to her sister sciences in conquering puerperal sepsis. Much is due to Rudolph Virchow, the founder of cellular pathology, who offered a new way of looking at the body as "a cell state in which every cell is a citizen." Much credit is also due Joseph Jack-

son Lister for his discovery of the use of chemical antiseptics, mainly carbolic acid. It is notable that, with characteristic modesty, Lister declared that Semmelweiss was his forerunner.

After all is said and done, however, I must agree with the writer who says:

"To Gordon of Aberdeen must be ascribed the credit of having first clearly demonstrated the infectious nature of puerperal fever."

To Charles Rigby we are indebted for much that is known today of ante partum hemorrhages. Nearly two hundred years ago Rigby differentiated accidental and unavoidable hemorrhages. He had a clear idea of placenta previa, defining it as a hemorrhage accompanying the attachment of the placenta to that part of the uterus which normally dilates as labor advances.

Crede of Berlin described a method of the management of the third stage of labor which was anatomically and physiologically correct.

The etiology and management of the toxemias of pregnancy have been developed so recently that it is difficult to discuss the subject with propriety and without the danger of being invidious.

In Renaissance obstetrics, eclampsia shared about equally with sepsis in mortality and morbidity.

It is entirely true that obstetrics owes much to her sister sciences in the field of the toxemias. To me the name of Richard Bright stands out in bold relief in kidney and liver pathology, and obstetrics owes much to him. Though it is the fact, as Garrison points out, that white clouds in the urine had been observed even by Hippocrates, that Saliceto, Italian surgeon, had pointed out the association of dropsy, scanty urine and hardened kidneys, it remained for Richard Bright to connect these symptoms with the peculiar inflammation of the kidneys that he found post mortem.

Another interesting figure is that of Sir William Withey Gull, who first described arteriocapillary fibrosis in nephritis. Development in the prophylaxis and treatment of the toxemias, including prenatal care, has been so recent that I dare not cover the period embraced by the last fifty years.

In the field of the mechanics of obstetrics there are names to conjure with. The greatest name is that of William Smellie. Smellie taught obstetrical mechanism by the use of dummies and phantoms ingeniously devised. The abdominal contents of his dummy had a most realistic appearance, the os could be seen to dilate and contract and the fetal head was so elastic that while it moulded on pressure it quickly regained its shape. Like all pioneers, Smellie was subjected to great ridicule by his medical confreres and notably by midwives. Mrs. Elizabeth Nikell, a leading midwife of the period, described him as a "great horse godmother of a he midwife."

As Smellie was the master of mechanics, so William Hunter was the master of obstetric anatomy. His great work on the gravid uterus with elaborate plates of the fetus and uterus was a marvel of accuracy.

Contemporary with Smellie was Sir Fielding Ould of Dublin, who wrote intelligently and accurately of the mechanism of labor.

We are most indebted to the Germans for knowledge of pelvic deformity. The great names are Naegele, who described the obliquely contracted pelvis; Litzman, the ovoid pelvis; Rokitansky, the spondylolisthetic pelvis; Baudelocque, the funnel shape pelvis, and others.

And now for a brief reference to inventions and discoveries which have helped to unhorse all four of the obstetric horsemen.

It is believed that the forceps was the invention of the charlatan Chamberlen family. The Chamberlen family was large, all of the men seem to have been doctors, and all the doctors, with characteristic charlatanism, disputed among themselves as to which one invented the forceps. Peter Chamberlen, nephew of Peter Chamberlen, Sr., who probably invented forceps, wrote his own epitaph: "To tell his learning and his life to men, enough is said by 'here lies Chamberlen.'" This same Peter offered to sell his secret to Mauriceau for ten thousand dollars. At the moment Mauriceau happened to have a deformed dwarf in labor, and Chamberlen was asked to demonstrate his invention. The case was totally unsuited to forceps delivery, and the patient died from ruptured uterus, undelivered.

Gradually the secret leaked out, and thus the obstetric forcep was born, at first a single blade to be since modified by many obstetricians of many lands.

Sir James Simpson was the first to use anesthesia in obstetrics. It must be remembered that the words anesthetic and anesthesia were coined by our own Oliver Wendell Holmes. Simpson first used ether after its discovery in Boston. After a number of experiments on himself and his friends with ludicrous results, Simpson adopted chloroform.

Simpson was deluged with abuse by medical men and the clergy. He was roundly denounced from pulpit after pulpit, the objections of the

clerical brethren being based on the primeval curse of women in Genesis. Simpson countered by quoting the passage from Genesis, "Adam fell in deep sleep." Simpson found an eloquent champion in the famous divine, Sir Thomas Chalmers, who silenced all opposition of the clerics. Simpson died at the age of fifty-nine, literally worked to death. His own comment on his life work was "I wish I had been busier."

It is a very far cry from Jacob Nufer, 1500, sow gelder, who successfully performed cesarean section on his own wife, to Parro, 1877; Sanger, 1882; Doederlein and Zweibel, 1904, and Beck, 1916.

It is also a very far cry in mortality from 70 to 80 per cent as late as the early seventies, to a mortality at present of little more than 1 per cent. But it is quite possible that the low mortality of the present day, made possible by clean surgery and improved technic, is too much of a lure for the impatient and "quick to cut" obstetrician.

In addition to these great names and great events, I nominate for the hall of obstetric fame:

That same Carl Siegmund Franz Crede for first advocating the use of nitrate of silver to prevent ophthalmio-neonatorum; Marmaduke Burr Wright, of Cincinnati, Ohio, who antedated John Braxton Hicks in combined version, though the procedure bears Hicks' name; James Marion Sims and Thomas Addis Emmett, who, while not obstetricians, were the founders of modern gynecology, that branch of medicine "sired by surgery and the legitimate offspring of obstetrics;" Mayor, the Swiss surgeon who first demonstrated auscultation of the fetal heart, and finally, Ambroise Pare, who made himself the greatest surgeon of his time by his courage, ability and common sense.

Norris in his presidential address to the American Gynecological Society said:

"There is nothing in medicine more interesting than the history of obstetrics.

"The charlatan Chamberlen, the courageous Mauriceau, the scholarly and astute Holmes, the pathetic Semmelweiss, the brilliant but obstinate Hunter; Pasteur, Lister, McDonald, Atlee, Sims, Tait Noeggarth, the dramatic discoveries of Long, Morton, Wells and Simpson, these go to make up the most fascinating chapters in the history of medicine."

I trust sincerely that I have been able to interest and entertain you with this "Odyssey of Obstetrics," the science and art of which the old French master, Guillemeau, said:

"The greatest disease that woman can have is that of the nine months; the crisis and cure whereof consists in their safe delivery."

THE ANATOMY AND DISEASES OF THE ETHMOID AND SPHENOID SINUSES*

By FREDERICK E. HASTY, M.D., F.A.C.S.,
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In the rapid development of rhinology many men, perhaps the majority of them, became overenthusiastic in doing surgery in the nose and para nasal sinuses. In recent years, if I misjudge not the trend of the times, there has been a sobering up, so to speak, of the rhinologist. Through bitter experience he has learned that many conditions encountered in the nose cannot be successfully remedied by surgery. This realization has caused the conscientious worker to ask why many rhinological abnormalities have not been successfully treated. It is my hope to stimulate thought and discussion of fundamental and basic influences that may produce morbid changes in the ethmoid and sphenoid sinuses.

EMBRYOLOGIC CONSIDERATIONS†

"During the third week of embryonal life there is evidence of beginning development of the nasal areas as shown by increasing thickness of the ectoderm on the anterolateral portions of the forebrain. At the end of the third week, or during the fourth week, the nasal area appears as a depression which is brought about by the increased thickness of the surrounding mesenchyme.

"In the latter part of the third month of intra uterine life the conchae nasales assume approximately their definitive outlines, and the corresponding meatuses become well marked. In the meatus medius two accessory folds are distinctly demonstrable, which by their variations in types and positions, play such an important part in determining the locations of the ostia of the cellulae ethmoidales anterior. In the meatus superior there is often found an accessory fold which, though smaller, resembles in general outline the bulla ethmoidalis.

"As the diameters of the invaginations increase there gradually develop lumina within the cylindric processes which by the sixth fetal month, usually show distinct cell formation. Primitive cells of the anterior ethmoidal group develop rather earlier and more rapidly than those belonging to the posterior group.

"The sinus sphenoidalis differs in its early development from the other accessory sinuses in that the primitive sinus does not have its origin from one of the furrows situated on the lateral nasal wall, but develops as an invagination extending from the posterior-superior portion of the recessus sphenoethmoidalis. In the narrowed posterosuperior portion of the recessus sphenoethmoidalis there is demonstrable in sixty-five-day embryos

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†Davis, Warren B.: Textbook on Nasal Accessory Sinuses.

an invagination of the mucosa extending into the posterior portion of the nasal capsule. The site of this primitive invagination persists as the ostium sphenoidale. Embryos of eighty-five to one hundred days show the development into the nasal capsule more distinctly, the advancement of the pouching process being more frequent in a postero-inferior and slightly lateral direction. The primitive sphenoidal sinuses thus come to lie posterior to the nasal capsule and anterolateral to the body of the sphenoid bone.

"The marked tendency of the sinus sphenoidalis to develop postero-laterally more rapidly than it does directly posteriorly is such that in the average case the lateral wall of the sinus becomes quite thin by the end of the second or third year, while the septum sphenoidale still remains relatively thick. Thus this early posterolateral resorption of the osseous wall soon brings the sinus into close relation to these cranial nerves which pass just lateral to the body of the sphenoid."

ANATOMY

I think that to speak of the ethmoid cells and of the sphenoid cells is much better descriptive terminology than to speak of the ethmoid and sphenoid sinuses. The lack of consistent arrangement and size in the ethmoid and especially in the sphenoid, can be so completely demonstrated that I am constrained to use the terms, ethmoid and sphenoid cells. The development of the ethmoid and sphenoid cells from birth seems to have been the subject of considerable argument, due, in part, I judge, to the lack of a standard basis upon which to estimate the size of the cells. Some observers state that the sphenoid is well developed in the first few months of life; others, that it is developed between the third and twelfth years of life. There seems to be no doubt that there is great variation in the development of the sphenoid cells and some variation in the development of the ethmoid cells in early life. This marked lack of uniformity of development has aroused in my mind the question as to the possible influence that might be brought to bear upon these structures by nutrition and by other factors that could affect the development of the child in general. I should like to lay particular stress upon the possibility that nutrition plays a very important part in the proper development of the sphenoid and ethmoid cells. I shall attempt to demonstrate the malformation of these cells as a result of poor nutrition.

Until recently otolaryngologists have not had the advantages of an x-ray equipment suitably constructed to give the best results in examinations of the para nasal sinuses. This is particularly true of the ethmoid and sphenoid cells. The films that I shall demonstrate were made in the chin-vertex position, and the outline of the sphenoid and ethmoid cells is projected through the top of the head. These films I have found to be very satisfactory in demonstrating individual cells.

NUTRITION

Nutrition as related to the development of the para nasal sinuses in children seems to have received comparatively little consideration. Pediatricians and otolaryngologists have realized in recent years that acute upper respiratory infections and the subsequent diseases of the structures of the upper respiratory system are the cause of a large percentage of the illnesses in children. It should be remembered that during the early months of life the head develops with tremendous rapidity. This is particularly true of that portion of the head commonly classified as the face. At birth the cranial portion of the head is fairly well developed, but the facial portion undergoes rapid development during the first few months of life. This has an important influence upon the development of the para nasal sinuses in that if the face does not become properly developed the sinuses cannot develop to normal size nor occupy normal positions. If the structures adjacent to the nasal cavities are not in proper position, then there is trouble ahead, for the reason that drainage and aeration will not be adequate to care for the demands of the nasal passages during acute inflammatory infections. Obstruction in the nose in adult life has long been recognized as a primary cause of empyema in the para nasal sinuses. Is it not likely that obstruction in the nasal passages is more detrimental in early life than in later years, for the reason that at best, in a young infant, the passages are mere slits? Furthermore, the mucous membrane lining these passages in the infant is delicate and more susceptible to infection and traumatism than in the adult. Ophthalmologists have keen appreciation of the influence of diet upon the well being of the conjunctiva. For years otolaryngologists have recognized the influence of feasting upon the incidence of colds and infections of the upper respiratory tract. An excess of sugars and starches has been considered to be a common cause of this disturbance in metabolism. Again, is it not likely that infants and children are even more susceptible than adults to improper nutrition? Dr. Deane, in 1927, made a statement before the American Triological Society which caused me to do much thinking. He reported that children who were kept from birth in a portion of the hospital isolated from visitors and on a diet prescribed by the hospital, had no

colds. I am of the opinion that improper feeding and improper hygienic surroundings are the main causes of upper respiratory infections in early life. We have stated that in very early intra-uterine life nature makes provision for the development of these structures and this development is continued through the stage of gestation. We have seen that after birth the development of the ethmoid and sphenoid cells continues, but that after birth there seems to be a marked variation in the development of these cells. This variation in development, in my opinion, can be explained to a great extent by the state of nutrition. We have intimated that mucous membranes can be caused to develop into an abnormal condition by improper nutrition. I would remind you that the engorgement of the mucous membrane of the nose immediately reduces the space for ventilation and drainage and thereby favors the growth of any bacteria that may be present in the nose, thus converting the mucous membrane of the nose from a protective membrane against infection to a favorable medium for the development of infection on the membranes and not only development of infection on the membrane, but the penetration of these organisms through the membrane.

Students of otolaryngology have become discouraged with the cnd-results of tonsillectomy as a cure-all for repeated colds and recurrent upper respiratory infections. Recurrence of lymphoid tissue in the adenoid space and the pharyngeal walls after tonsils have been removed has frequently been the source of chagrin and worry to the man who removes the tonsils. I am of the opinion that such cases were primarily and essentially para nasal sinus infection, the posterior ethmoids being the most common location of the infection. It should be remembered that in the fight against disease, the individual is no stronger than the resistance of his important tissues.

So-called colds, or upper respiratory infections, are the greatest economic problem in the health of our populace. How often do we see an individual mentally fit and capable, partially or completely physically incapacitated by upper respiratory infections! I have in many instances convinced myself that these individuals are subjects of developmental defects in the region under discussion.

A few years ago, and in some communities even until this time, rhinologists operated upon the antra of a great many children. They soon found, however, that one operation did often not permanently cure the patient. I venture the suggestion that the infection, in a certain percentage of cases, at least, was in the ethmoid cells and that the empyema in the antra was a secondary development.

In the anatomical laboratory I was forcibly impressed with the marked variation and almost total lack of consistency in the size, arrangement and relation of the ethmoid and the sphenoid cells. It is now possible to obtain rather definite information as to the anatomy of these structures in living persons by properly made x-ray plates. At the same time that we are studying the anatomy of a patient we have a good opportunity to study the pathological changes that may have developed. This I have found to be of tremendous value in dealing with rhinological problems. I am now convinced that empyema of the para nasal sinuses originating within the sinus has for its origin, in the great majority of cases, infections in the ethmoid cells, and that, therefore, infection in the frontal sinus is usually secondary to infection in the ethmoid cells. The infection may have cleared up in the ethmoid cells, and at the same time may have become partially or completely enclosed in the frontal sinus. Diseases of the antra are most probably secondary to the ethmoid and frontals except in those cases where there is an extension of disease about the roots of teeth. It would seem then, therefore, that after all the key to infections in the para nasal sinuses, *per se*, originates within the ethmoid cells, and in practice I find this fact to be true. I grant you, in many instances, the empyema in an antrum, or a polyposis may be so advanced as to overshadow the extent of disease in the ethmoid cells, but I do contend that evidence of disease in the ethmoid of longer standing than that of the other sinuses can be demonstrated. It is not at all uncommon to find marked changes in the antrum, and on inspection to find some evidence of trouble in the ethmoid and then for the x-ray films to indicate trouble in the ethmoids on the same side as that of the antrum which is involved, namely: thickening and clouding of the mucous membrane and the bony walls of the middle and posterior ethmoid cells. I think if one has once firmly fixed in his mind the right idea of the development of the para nasal sinuses and of their subsequent diseases, that the sequence and incidence, as well as the coincidence of subsequent infections will be better understood. For a long time the study of the para nasal sinuses and their diseases did not lead me to what I considered to be a reasonable and rational chain of developments. Even now the whole matter

is not absolutely clear in my mind, but it is considerably clarified. With these ideas expressed let us turn to the consideration of some concrete examples. Demonstrations and history are not so complete as one might wish, in that the same patient has not been observed through the period of development on to adult life. The fragmentary evidence in several cases, however, can be so connected and correlated as to develop a strong line of circumstantial evidence.

First, I should like to present for your consideration a short series typical of the so-called Sluder's syndrome, and I should like for you to keep in mind the possibility that the symptoms of these individuals are due either to active disease or developmental defects, or may I be justified in saying, to pathological anatomy which is really due to developmental defects?

In the second group of cases I should like to offer an argument contradictory to all the measurements that we have been eager to obtain with the hope of getting an idea of the location and size of the sphenoid cells.

Unfortunately for me, the most satisfactory method of study of x-ray films of the ethmoid and sphenoid cells is to have stereoscopic films in a good stereoscope. I have had the outline, however, of a number of ethmoid and sphenoid cells traced on paper with the idea of giving some information as to the topography of these cells. I think I can demonstrate to you that there is no way of determining from measurements alone the size and location of the sphenoid cells. I venture the assertion that in a very great percentage of the so-called sphenoid sinus operations, when the surgeon believed that he had entered and drained the sphenoid cells, he had in reality drained the posterior ethmoid cell. This is probably the explanation of his unfavorable results. For the benefit of the surgeon and the welfare of the patient there should be some way of keeping in the mind of the operator doing sphenoid surgery the possibility of marked anatomical variations. In two instances in which patients have died with brain abscess, at post mortem I have found there was a dehiscence of the superior wall of the sphenoid sinus and that the infection extended from the sphenoid sinus even though there was not marked evidence of disease in the sphenoid cells.

I shall now demonstrate a few plates which will not only show the anatomy, but acute or sub-acute infections in the ethmoid and sphenoid cells. These patients complained of pain in the usual location for infection in the ethmoid and sphenoid cells and ran an elevation of temperature. I have on several occasions caused the temperature to rise suddenly as much as 2 or 3 degrees by manipulations in the nose, such as tampons, and suction. I have treated a number of such cases by confinement to bed, putting them on liquid diet, pushing fruit juices and alkalies, with little or no medication or treatment of the nose. With this method my patients have been kept more comfortable and my results have been much more pleasing.

CONCLUSIONS

(1) It is encumbent upon the rhinologist to ponder well his rhinological problems before venturing to do destructive surgery.

(2) Nutritional deficiencies may result in maldevelopment of the ethmoid and sphenoid cells, which will cause trouble as long as the individual lives, regardless of attempts at corrective surgery. Poorly planned corrective surgery may even make these conditions worse.

(3) In those cases presenting developmental defects, any corrective surgery should be well planned and carefully done, and rules of proper nutrition and hygienic living should be advised.

(4) Disease in the ethmoid cells is probably the original focus of infection that subsequently involves other para nasal sinuses, except in instances where disease extends from without to within the sinus, as in the case of abscessed teeth in the antrum.

(5) X-ray films can be so made as to give valuable information of the topography of the ethmoid and sphenoid cells, and in many instances, valuable information is revealed as to pathological changes which may have developed in these cells.

DISCUSSION (*Abstract*)

Dr. Homer Dupuy, New Orleans, La.—I shall limit my discussion to one phase of the subject, the sphenoid sinus. Our Chairman has learned of two deaths directly attributable to sphenoid surgery. I know of several others. Why these fatalities? The answer is, because the operators had no pre-operative knowledge of the distance from the tip of the anterior nasal spine to the anterior sphenoid wall. They unintentionally, with fatal results, perforated the roof of the sphenoid, the sella floor. A previous contribution based on experimental work in our Charity Hospital emphasized, in over 100 observations, the fact that this distance varies from 5 to 8 cm. Therefore, we cannot depend on the too standardized measurements of textbooks which read 7 cm. Our method is to obtain a nearly perfect lateral view of the skull. A straight line is drawn on the radiogram from the anterior nasal spine to the anterior sphenoid wall. This line is continued to the sella floor, which is actually the roof of the sphenoid. Should the measurements give us 7 cm. to the anterior sphenoid

wall, once we have passed this distance we know, if we have in our surgery stuck closely to the median septal line, that we are in the sphenoid cavity. With our previous x-ray information we can be on our guard relative to the sella region, for it is in this area that the fatal damage is usually done.

We are impressed with the frequency of sphenoid disease. There will be a corresponding increase in surgery of the sphenoid. Unless we are better equipped with anatomical knowledge of these parts, unless we appreciate that the distance from the nasal spine to the anterior sphenoid is variable, we shall only add our fatalities to the list. We presented a paper* on this subject at the Miami meeting of our Association in this Section. We believe we can by good x-ray measurements, and it must be a nearly perfect lateral picture, place surgery of the sphenoid on a safer surgical basis.

Dr. Horton Casparis, Nashville, Tenn.—It is very encouraging to me as a pediatrician to hear Dr. Hasty as an otolaryngologist stress the importance of nutrition. In the first place, I think that a great many upper respiratory infections could be prevented, or at least could be prevented from going on to the chronic stages in children if proper attention were paid to the nutrition of the child from birth. It is not enough for a child to get an adequate amount of food, but it is necessary that he get a properly balanced diet, and it is extremely important that this properly balanced diet be started within the first two to four weeks of life. In other words, we know that the absence of vitamin D results in poor development of the muscles and bones, at least, and this deficiency is at work months, often, before we can recognize the results clinically. There is no reason to believe that this disturbance would skip the part of the anatomy in which you are particularly interested. We know, too, that the absence of vitamin A results in damage to the mucous membranes. Therefore, we feel that every child should have at least these two factors added to the diet in the form of cod liver oil sufficiently early to head off the defects which result from their lack.

If these vitamins are necessary for prevention of disease then it seems likewise important that when one finds infections in the accessory sinuses it is equally necessary to realize that a good, well balanced diet is one of the individual's best means of combating his infection.

Turning the subject around, these infections make it very difficult for us pediatricians to maintain good nutrition in a child. A vicious cycle is set up: poor nutrition is conducive to poor development of and infection in these sinuses, and such infection seriously affects nutrition. So you see that we are just as dependent on you as you may be on us in the treatment of these disorders.

Dr. Clifton M. Miller, Richmond, Va.—As to focal infection, what do we mean? We know when we go into the sinuses that we find germ life. Fifty years from now this period of surgery and medicine will be known as the germ theory period, and a large part of it probably will be abandoned, although all the facts of germ life infection have been proved. But we are approaching the time of the vitamin, and if we use the vitamin properly, and obtain proper nutrition, we will not have many of these infections. A poor nutritional condition affects the entire mucous membrane, and germ life is invited to grow there, so that the symptomatology that comes from infection in the early period of life is often secondary to this nutritional defect.

We do not do very much surgery in this region. If we do very much surgery in children younger than fifteen or sixteen years of age we shall do much harm. Look after the state of nutrition, balance the diet, use a good pediatrician to advise and help you, and just bring about enough drainage to allow aeration: drainage, nutrition and sunlight. Get sunlight somewhere, somehow, with the ultraviolet ray if necessary. That is the nearest to Nature's own sun.

Dr. Daniel D. V. Stuart, Jr., Washington, D. C.—As a neurologist, I do not feel competent to talk on this general subject, but two points which Dr. Hasty brought out have a lateral bearing on my work and I should like to mention them.

The first is in connection with variations of structure of the posterior ethmoid and sphenoid cells. Occasionally the neurologist is asked to see a patient supposed to have an intracranial growth because of choked disc; together, perhaps, with paralysis of one or more of the motor nerves of the eye, and headache and subjective vertigo. On complete examination the patient may be found not to have a brain tumor after all. but may be suffering instead from a posterior sinusitis; and relief of this may be followed by the prompt disappearance of all neurological signs. I have seen a number of such cases myself. Of course the explanation lies in the anatomical relation of the second, third, fourth and sixth nerves to the sphenoid and occasionally the posterior ethmoid cells, and the defects in the walls of these cells that Dr. Hasty has illustrated.

We do not know whether these dehiscences and deviations of structure are true anatomical anomalies or are due to nutritional disturbances, as Dr. Hasty has suggested. We do know, though, that such variations exist, and that this possibility is not infrequently overlooked or disregarded. For this reason I think Dr. Hasty's address is most timely. His suggestion as to nutrition opens the way to the possible prevention of a certain number of serious posterior sinus infections, which may simulate brain tumor; and which may go on to blindness, or to loss of life through meningeal involvement.

The other point in the Chairman's address which touches on neurology is in connection with the so-called nasal ganglion neurosis, and the Sluder type of headache. There is such a thing as a true neurosis; a psychogenetic state; but I have never been satisfied that psychogenetic states, *per se*, are capable of bringing about the physical symptom of pain. If a patient is a neurotic, a pain that otherwise might be disregarded may be magnified tremendously by his neurosis, or even made more or less permanent. It is my belief, however, that the pain must have some physical basis, however slight; and that it will not be relieved until this basis is found. On this account I object to the term neurosis as applied to this condition, and call it "neuralgia" instead.

The neurologist sees a great many patients, some sent by otolaryngologists, who have been given a clean bill of health both from the general physical and from the eye, ear, nose and throat standpoint; and the neurologist is told that the patient has "neurotic headache," and is asked to cure it, but he cannot do it. The patient has a nasal ganglion neuralgia, not "neurosis." For this important physical syndrome I think Dr. Hasty has

*Dupuy, Homer: Further Experience with a New Method for Measuring Intra-Nasal Distance to the Sphenoid Sinus. S.M.J., 23:193-195, 1930.

offered a most plausible theory of origin. This sort of thing occurs frequently; and I have known many otolaryngologists to disregard the point which Dr. Hasty has brought up today.

Dr. E. G. Gill, Roanoke, Va.—I had the pleasure of seeing some of Dr. Hasty's stereoscopic plates, and I hope everyone will avail himself of the opportunity tomorrow to see them.

There is one thought that I want to present in this discussion, and that concerns the antrum. Dr. Hasty says the antrum infection is secondary to ethmoid infection, but I think it is the other way around. Dr. Goodyear demonstrated that fact at Detroit before the meeting of the American Medical Association this year. He injected iodized oil into the antrum, with the patient in upright position, then had the patient lie down an hour and made another plate, and a great deal of the opaque medium had gravitated into the frontal and ethmoidal sinuses. If that takes place in an hour's time, how much will take place during the night? You have all had cases in which after you washed out the antrum the frontal pain subsided. If these observations are correct, they have something to do with determining the reaction to pressure in these cases.

Dr. Louis Daily, Houston, Texas.—Whether an ethmoid cell will mislead us will depend on the procedure one follows in attacking the sphenoid. If one follows the Hajek method, first removing the middle turbinate and cleaning out the ethmoid cells that lie over the anterior wall of the sphenoid, before entering it, one may sometimes mistake a posterior ethmoid cell for the sphenoid. But if the middle turbinate is conserved and pressed laterally, and the sphenoid is attacked between it and the posterior attachment of the septum, there is no risk of being confused by an ethmoid cell in this area. In some cases it is possible to crowd the middle turbinate far enough laterally to get a good exposure of the ostium; then we may follow the Halle technic and make a cross incision through the mucous membrane with the ostium at its center, elevate the mucous membrane and remove as much of the anterior wall as possible. The difficulty is that the artificial opening has a tendency to diminish in size and may close up entirely. One has to be careful not to remove the anterior wall too low to avoid a severe hemorrhage.

The postoperative complications, such as meningitis in exenteration of the ethmoid sinuses, are due to injury of the cribriform plate. This is more likely to happen with an operative technic, which removes the middle turbinate. In the Halle technic the middle turbinate is spared and it forms a barrier between the cribriform plate of the operative field. With this method it is possible to exenterate the whole ethmoid labyrinth without injuring the cribriform plate. Most of the cases requiring radical surgery have been subjected previously to conservative operations, and usually their middle turbinates have been removed. Here a thorough knowledge of anatomy is essential and great caution must be exercised to avoid injury to the cribriform plate. The same is true of intranasal frontal operations.

In my experience, maxillary sinusitis caused by a tooth infection is rather rare. Ethmoiditis does sometimes follow antrum infection. In 1923, at the International Congress in Kissigan, Hirsch pointed out that the majority of cases of nasal polyps are due to a maxillary sinusitis and not to an ethmoiditis, as has been believed formerly.

CHRONIC ENDOCERVICITIS: ITS SEQUELAE AND TREATMENT*

By G. Van Amber Brown, M.D., F.A.C.S., Detroit, Mich.

Chronic endocervicitis, or chronic endotrachelitis, as a clinical entity has long been recognized as the most prevalent among gynecological disorders. It is estimated that approximately one-third of all women are afflicted with this condition, a condition which may menace the entire gynecic system. It is more general than the common cold. While much has been written concerning it, still it is an unsettled problem, and one upon which more light needs to be shed. Yet, current textbooks fail to accord it special consideration as such. Instead it is treated rather indifferently, for its description is scattered under various headings, as, "cervical catarrh," "simple follicular, or papillary erosions," "eversion," "ectropion," "ulceration," "hypertrophy of the cervix," "cystic degeneration," and so on, all of which depict only different features of the same infectious process, the nature, course and significance of which is obscured by perpetuated misconceptions and misleading dogma that prevent its effectual treatment. I will therefore endeavor to re-emphasize some phases of the disease pointing to the importance of its early recognition and treatment.

ETIOLOGY

The gonococcus is the most frequent provocative organism in chronic endocervicitis, while streptococci, staphylococci, and the colon bacillus infections are not at all infrequent findings in the order enumerated.

It is estimated that 95 per cent of chronic gonorrheal infections are located within the cervix.[1] We must regard the average gonococcus infection as essentially involving the cervix, rather than the vagina, except in infants, and must consider the infection a cervicitis rather than a vaginitis. Infection of the cervix frequently dates back to a vulvitis of early infancy. In infants, the exanthemata and especially scarlet fever, protracted diarrheas with probable contamination from soiled diapers, and general special debilitating conditions, seem to confer a special susceptibility to cervical infections. In adults a congenital mal-development of the cervix (more especially when traumatized by dilatations, curet-

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tage, or birth injuries) embodies the most prolific predisposing factor to chronic endotrachelitis.

SYMPTOMS

The symptoms of cervical inflammation constitute a considerable proportion of the pelvic complaints common to women.

The objective features of chronic endocervicitis are typical and plainly evident to inspection. The normal cervix looks clean, is dry and velvety; the pathological cervix looks dirty, is wet and has lost its velvety character. The nullipara complaining of dysmenorrhea and sterility with her conical cervix showing its inflammatory halo encircling a small pouting os, extruding a tenacious clump of mucus; or the multipara, with lacerated eroded hypertrophied lips, honeycombed with Nabothian cysts under a granular surface that bleeds on the slightest touch, all of these, in their varying degrees of intensity, constitute a clinical picture so familiar as to call for no detailed delineation. Leucorrhea is nearly always present. Sterility[2] is fairly common in chronic endocervicitis and a cure of the condition is in many cases followed by pregnancy. Dyspareunia is a frequent complaint. The ascending lymphangitis[3] causes some degree of parametritis, perisalpingitis or salpingitis, and oophoritis with the symptoms of low grade pelvic inflammation. The lymphangitis also extends along the utero-sacral ligaments, and they are very sensitive. There is usually some degree of dysmenorrhea and backache. The lumbosacral backache is at times confused with sacroiliac subluxation. In many women who have borne children the uterus becomes large and heavy because of the intramuscular lymphangitis and circulatory stasis. Premenstrual and postmenstrual metrorrhagia may follow this hyperplasia. The patient may have vague pelvic discomfort with some bearing-down sensations. Parallel with the pathological course, the intensity of its symptomatic manifestations will range from a simple but persistent gonorrhea to complete functional invalidism.

The subjective symptoms accompanying cervical disease are all too frequently placed in the ambiguous category of "reflex neurosis."[4] We have learned to recognize systemic manifestations from primary foci in the mouth, the tonsil, the gall-bladder, the appendix, the urethra. Why not from the cavity of the cervix? Why term a symptom toxic there, and neurotic here? Chronic endocervicitis should be recognized as a primary infectious focus, and its systemic symptoms as toxic manifestations.

TREATMENT

Obviously the best treatment of chronic endotrachelitis is the employment of prophylactic measures. Through lack of cleanliness during examination or unwarranted instrumentation of the cervix, the physician may start up the trouble. Since it is quite certain that infection will take place in unrepaired cervical lacerations, these lacerations should be corrected as early after delivery as conditions will warrant. Prophylactic treatment includes everything which may be done to prevent infection of the cervical glands.

As curative measures, I do not use vaccines, nor do I employ diathermy, ionization, the curette, or injections into cervical tissue. The results are too uncertain and frequently extend the infection. Radium, I have not employed, though good results are reported from its use. Douches have little or no effect on the disease, their chief benefit being to decrease local discomfort by cleansing the vagina of irritating discharge. Topical applications possess small value and are only mildly palliative. They can only be curative when the disease process is very superficial (2 per cent of cases). Their chief value is in preparation of the field for cauterization, or surgical intervention, the two methods now generally considered the most logical in view of our modern knowledge of pathology and the structures involved.

Use of Cautery.—Chronic endocervicitis, whether or not associated with slight tears of the cervix, when properly treated by cautery, gives excellent clinical results. Cautery treatment is indicated in 80 per cent[5] of cases and may be carried out by using either the Paquelin cautery, or by striping the diseased area with a thin bladed nasal electric cautery tip as first advocated by Dickinson.[6] My personal preference is the latter. In patients who are poor surgical risks the use of the cautery is the treatment of choice. If an acute, or subacute, salpingitis complicates a chronic endotrachelitis, the use of the cautery is contra-indicated, as it may be followed by peritonitis and death.

Cautery is of particular benefit when used in the treatment of chronic endocervicitis complicating pregnancy. The cauterization may be done at any time provided the patient has not passed the twenty-eighth week of her pregnancy. Miller, Martinez, and Hodgdon,[7] in a study of over two thousand cases so treated, show no untoward results, but a smoother convalescence, a lessened morbidity, and an apparent lowering of mortality rate.

Surgical Treatment.—How often is one of the adnexal structures removed for periadnexitis, and the other at a subsequent operation, when both could have been saved by a proper and timely attack on the original focus within the cervix. Often a chronic salpingo-oophoritis[6] will be seen to clear up following the cure of a chronic endocervicitis. During the child-bearing period, operations on the cervix should be planned with regard to subsequent pregnancies, as well as with a view to removing the disease-bearing area. When chronic endocervicitis is accompanied with extensive tears of the cervix proper, surgical procedure is alone curative.

Several types of amputation have been described, each having a limited usefulness. High amputation is disappointing,[8] because it is followed in 5 per cent of cases by post-operative hemorrhage and in 10 per cent of cases with a decided augmentation of pre-existing menorrhagia. Eighty per cent of women in whom pregnancy might reasonably have been anticipated to follow the operation remain sterile. On the other hand, of those who become pregnant 50 per cent terminate prematurely, while of those who progress to full term, even a larger proportion experience difficult and prolonged labor. High amputation of the cervix for chronic endocervicitis during the child-bearing period does not appear to be a logical procedure.

Neither trachelorrhaphy nor low amputation of the cervix can be considered curative measures, because each operation leaves a portion of the diseased endocervium unremoved. The principle involved in these procedures is analogous to removing only a portion of a carbuncle.

Cases showing either extensive conditions of hyperplasia and cyst formation, with or without tears, constitute about 16 per cent of cases of chronic endocervicitis. The tracheloplasty of Sturmdorf[9] lends itself admirably to the treatment of these cases. This surgical procedure, in which a cone of the whole endocervical mucosa is removed, leaving the funnel of cervical muscularis denuded and covered with loose cylindrical flaps of vaginal mucosa, gives the nearest uniformly good results. This operation, when done with proper technic, provides complete enucleation of the entire endocervical mucosa; it preserves the muscular structure; it preserves the natural depth of the uterine cavity; it produces and fulfills the physiological demands; it meets the pathological indications and obviates the technical shortcomings enumerated in connection with other procedures; and it is alike applicable to infected cervices of either nulliparous or multiparous. Further, so far as I am aware, in no case reported in the literature has malignancy developed in the cervix in which previously the Sturmdorf operation was employed.

Some facts regarding the physiology, anatomy, pathology of the structures involved are the deciding factors in interpreting symptoms and selecting treatment.

PHYSIOLOGY

Physiologically, the cervical canal presents nothing more than a passive communicating channel between the vaginal and uterine cavity.

Structural Characteristics of the Myometrium.—The key[10] to the architectural scheme of the uterine musculature is revealed in its formative, not in its matured state. To gain a clear conception of its mechanism it is necessary to discard the accepted subdivision of this single muscle into several layers. Such a subdivision is purely arbitrary.[11] There are no distinct layers, but a single muscle presenting different angles in the course of its component bundles. Briefly stated, these bundles are arranged in a succession of fan-shaped muscle-sprays that wind spirally downward from each fallopian angle throughout the whole uterus to the external os. Every muscle contracts toward its fixed point, and for the uterine muscle such relatively fixed points are furnished through its fascicular prolongations in the round and broad ligaments at the pelvic brim. The myometrium is composed of smooth muscle fibers which, like all nonstriated muscle, exhibit the intrinsic phenomenon of rhythmic automatic contraction independent of any neurogenic stimuli. An immobile muscle whether in the uterus or elsewhere degenerates. The rhythmical contractions of the myometrium are necessary not only in maintaining the nutritional and functional integrity of the uterus as a whole, but in serving the equally essential purpose of drainage. The cervical secretion must find egress from the normal mucosa and more especially from the diseased. In the normal state such drainage is effected, not merely by a passive outflow through a patent os, but by the active rhythmic expression resulting from uterine contractions. To comprehend this mechanism it is necessary to discard the anatomical myth of a cervical sphincter.[4] Such a sphincter would imply the existence of a concentrically contracting muscular ring. The structural design of the cervical musculature precludes any concentric closure of its outlet (which dilates with every uterine contraction) because its fibres, continuous with those of the corpus uteri, do not at any point

completely encircle the cervix, but are disposed in compact successions of oblique circle segments, which by contracting spirally upward necessarily shorten every diameter of the uterine cavity and, by uncoiling in the cervix, widen the os like an iris diaphragm in a microscope. Cervical dilatations thus become an integral part of uterine contractions, instead of a passive relaxation in a hypothetical sphincter.

Blood Vessels.—The blood supply to the uterus is abundant and the veins being devoid of valves leaves no provision other than muscular contractions to prevent local circulatory stasis and its consequences.

Since the specific functions of the uterus[12] in menstruation and gestation demand a wide range in the control of the blood supply (like the heart), the uterus automatically responds to the fluctuating circulatory necessities by rhythmic contraction and dilatation, not only during pregnancy, but throughout its functional existence.

The Specialized Characteristics of the Cervical Mucosa and Endometrium.—The cervical mucosa is composed of deeply penetrating racemose glands which simply secrete mucus. It does not participate in the cyclic metamorphosis of the corporeal endometrium essential to menstruation or deciduation. But more significant than this structural and functional contrast is the striking disparity between the pathological manifestations displayed below and above the internal os. The cervical mucosa evinces a marked susceptibility to infection, while the corporeal endometrium, contrary to orthodox conceptions, is practically immune. The endometrium has low cuboidal epithelium, simple shallow mucous glands, and is specialized for implantation of the ovum, varying greatly during different periods of the menstrual cycle.

The immunity of the endometrium to ascending infection is marked. Though it was shown earlier, recently Hitchman and Adler[13] have conclusively demonstrated that all of the histologic features generally depicted as "chronic endometritis," inclusive of typical round-cell infiltration, constitute only the normal transition of the endometrium into the transudative phase of its menstrual cycle. Even that infrequent condition clinically labeled "hypertrophic endometritis" but more correctly termed glandular hyperplasia, is never inflammatory in character, but a functional adenomatous outgrowth, analogous to that presented by the thyroid gland in Graves' disease. Perhaps the most important bacteriological study of the endometrium is that of Arthur H. Curtis,[14] who found that pyometra and recent exploration excepted, the endometrium almost never shows bacteria except when there is infection of adjacent pelvic tissues. The corporeal endometrium, contrary to orthodox conceptions, is practically immune to infection. Chronic endometritis, *per se,* with bacteria present in smears or cultures, is practically to be ruled out as a clinical entity.

The most recent bacteriological studies[15] fully substantiate the relative immunity of the corporeal endometrium to ascending surface infection from the cervical mucosa. While this subject is still a matter of academic controversy the majority of pathologists concede that, clinically at least, chronic endometritis may be safely discarded.

Absorption and Drainage by the Lymphatics.—It is half a century since Leopold[16] clearly demonstrated the normal uterine lymphatic circulation. Quoting briefly from Leopold's description, which up to the present stands unchallenged, the uterine lymph current may be traced from its origin in the cervical and corporeal mucosa directly to the myometrium. Here it branches into an extensive capillary net, which, spreading on the perimysium, penetrates every fascicle of the entire uterine musculature of its subperitoneal surface, whence it drains into two main collecting channels that course parallel to the uterine and ovarian blood-vessels at the base and top of the broad ligament. It is this normal lymphatic envelopment of the perimysial sheath and adnexa that determines the course of an infection from the cervical mucosa along the intra-muscular planes of the uterine and tubal walls to the ovarian tunica albuginea. An ascending lymphangitis infiltrates the myometrial muscle sheaths, occasionally establishing disseminated miliary myometrial abscesses, and progresses to the periadnexal lymphatic ramifications, inhibiting tubal peristalsis, kinking the tubes and agglutinating their fimbrial ostia by the production of bands which occasionally create tubal diverticula having ectopic possibilities. Finally, reaching the ovaries,[17] the lymphatic infiltrate thickens their capsular tunic, impeding the normal rupture and regression of the Graafian follicles, with ultimate development of retention cysts. In short, we find a chronic ascending lymphangitis, with its resultant impairment of uterine, tubal, and ovarian function that links the pathology and symptomatology of chronic endocervicitis.

Every practitioner and student should be made to realize that chronic endocervicitis is an essen-

tial factor in the production of pelvic inflammatory disease. Pyosalpinx, hydrosalpinx, utero-ovarian cysts and abscesses, ovarian sclerosis, uterine fibrosis, all of apparently insidious development and obscure source, will usually reveal their primary focus in a chronically infected cervical mucosa. Most important among the derangements resulting from chronic endocervicitis are the disturbances in menstruation, fecundation, and deciduation.

END RESULTS OF TREATMENT

There is no satisfactory way in which one may accurately estimate end results. Physicians are apt to be critical in checking the work done by others and generous in results of their own operations. One patient may report a cure when another would admit only improvement. Again apparent failures may result from a new infection. The cure of leucorrhea is the usual basis in judging results, since this may be determined by a questionnaire. Other evidence is all too frequently neglected. These should be remembered in any attempt to compare the end results of different procedures. However, by careful selection of patients, and choosing the proper method for the given case, it is possible to carry the treatment to a satisfactory conclusion in about 98 per cent,[5] without complications arising. Two per cent will have minor complications, such as pelvic discomfort and bleeding.

CONCLUSION

Finally, in the study of chronic endocervicitis, it is evident that no method of treatment is applicable to all cases. It is further evident that any plan will fail which does not take into consideration the actual structure of the cervix uteri and its contiguous parts. It is indispensable that we should bear in mind the anatomical facts and the pathological course as outlined above. By so doing it would appear sufficiently evident that the whole symptomatology and sequelae of chronic endovervicitis may be readily predicted.

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THE RESULTS OF AGGLUTINATION TESTS FOR UNDULANT FEVER*

By J. HEYWARD GIBBES, M.D.,
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Wainwright has presented an excellent historical sketch of undulant fever, tracing its evolution from the clinical recognition of Malta fever by Marston in 1859 through the bacteriological investigations of Bruce and Hughes, the work of the British Commission in the period of 1904 to 1907, the discovery of the *Bacillus abortus* by Bang, Evans' studies showing the similarity of this organism to the *Micrococcus mellitensis* and the report of Keefer's case in 1924. Following the report of this case by Keefer, and going through the year 1925, 10 cases of this disease were reported over the United States as a whole, the cases occurring in six widely separated states, exclusive of Texas, Arizona and New Mexico, where Malta fever was regarded as indigenous. As illustrating the attention that was attracted by the recognition of this disease, it suffices to point out that in 1928 and in the first five months of 1929, 1,000 cases were reported in forty-two states, exclusive of the ones above mentioned. And the number of cases has continued to mount.

In South Carolina, the first case of undulant fever was reported by Dr. Ernest Cooper in the Fall of 1928, the diagnosis being established by a suggestive clinical course, a positive agglutination test and the recovery of the organism

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from the blood stream. Dr. H. M. Smith, Director of the South Carolina Public Health Laboratory, tells me that in the following year his laboratory made the diagnosis of this disease by means of the agglutination test in 21 cases. Here, again, we see an apparently alarming incidence of the disease following upon the report of a single case.

In reading the various case reports and statistical analyses as they were presented in the current medical literature, it occurred to me that the diagnostic criteria that were being applied to the disease were far from standardized, and I determined to check the clinical reliability of the agglutination test in our own Public Health Laboratory.

The diagnosis of undulant fever must depend upon clinical observations, the agglutination reaction of the blood serum, and the growth of the micro-organism from the blood, urine, stool and other body fluids.

The clinical picture has been described as protean. The disease is said to appear as intermittent, as undulant, as malignant, and as ambulatory. But in some of these so-called types there is no characteristic picture which stamps the condition as one thing and nothing else. Too often the best that we can do on a clinical basis is to suspect.

Bacteriological studies, the recovery of the organisms in cultures, are, of course, satisfactorily conclusive. But it is important to observe in passing that difficulties are to be encountered here, in that no less than eleven strains of the brucella organism have now been isolated, that very refined bacteriological methods are required for the culturing of some of them and that differentiation of the bovine and porcine varieties is surrounded with difficulties. So true is this that no less an authority than Theobald Smith has advanced the idea that the bovine organism is relatively harmless for man, and that most of the human cases have been due to infection by the porcine variety. However, facilities are not available for these batceriological studies in the smaller urban and rural districts.

It is safe to say that the great majority of the cases that have been reported as undulant fever in this country, almost all of those from South Carolina, have been so designated on the basis of the agglutination test alone. The question arises as to how much reliance is to be placed in this test.

In February, 1929, I began the collection of blood from 100 consecutive patients, all of them afebrile and free of all signs and symptoms that might be related to undulant fever, and had the agglutination test for *Brucella abortus* done on them at the South Carolina Public Health Laboratory. From this series I obtained a positive report in 17 cases in titres of 1-100 or higher.

In an effort to compare the work of our own laboratory with that of another, I wrote to Dr. McCoy, Director of the United States Hygienic Laboratory in Washington, and asked if he would run a series of tests on specimens of blood that were to be examined at the same time in the South Carolina Public Health Laboratory, with the full knowledge of Dr. Smith that such a check was being made. It is due to the kindness and cooperation of these gentlemen that I am able to submit the data that are shown in *Table I.*

TABLE I.

Analysis of 100 Agglutination Tests for Undulant Fever:

U. S. Hygienic Laboratory	5	positives
	1 to 10	in 2 cases
	1 to 20	in 1 case
	1 to 160	in 1 case
	1 to 1280	in 1 case
S. C. P. H. Laboratory	36	positives
	1 to 50	in 4 cases
	1 to 100	in 11 cases
	1 to 200	in 13 cases
	1 to 400	in 6 cases
	1 to 800	in 2 cases

In only one specimen of blood was there the slightest agreement between the two laboratories, and this specimen was from a patient who was suffering from a febrile illness of three months' duration, who had a palpable spleen, profuse sweats, and from whose blood stream a gram-negative coccoid organism was recovered. In this case the Washington Laboratory reported a positive agglutination reaction in dilution as high as 1-1280 and the South Carolina laboratory a positive test in dilutions as high as 1 to 800. A specimen of this blood was sent to Dr. H. L. Amoss, at the Johns Hopkins Hospital, and he reported that the serum failed to agglutinate any of the eleven strains of brucella there, in any dilution. In all other instances the laboratories disagreed entirely. In other words, all of the remaining 35 sera that were reported as positive by the South Carolina Laboratory were reported as entirely negative by the Washington, and the four that were reported as positive in Washington were negative in Columbia.

Four of the 100 patients had fever. One of these was considered as a proved case of undulant fever on the basis of the clinical course of the disease and the positive blood culture, and one patient ran a typhoid-like course for three weeks and recovered before a diagnosis was made. The undulant fever patient gave a positive agglutination test in a dilution of 1 to 1280 in Washington and 1 to 800 in Columbia, and the other case gave a negative test in Washington and a positive test in a dilution of 1 to 100 in Columbia. The third febrile case had estivo-autumnal malarial parasites in the blood, and the fever readily responded to quinine. This serum was negative in Washington and positive in Columbia in a dilution of 1 to 100. The fourth febrile case had a post-influenzal respiratory in-

fection with the fever disappearing as the signs in the lungs cleared. The serum was reported negative in Washington and positive in Columbia in dilution of 1 to 200.

In one case of myocardial insufficiency in a man fifty-four years of age, afebrile, with a history of typhoid fever twenty-six years before, the South Carolina Laboratory gave a positive report in a dilution of 1 to 800. Of the 6 patients who were reported as showing agglutination reactions in dilutions of 1 to 400, none had fever and none of them gave a history of a typhoid-like illness in the past. Of the 13 patients who showed positive tests in dilutions as high as 1 to 200, only one had suffered in the past from an illness that had been thought to be typhoid fever. Likewise, in the 11 patients who gave positive reactions in dilutions of 1 to 100, there was only one who had a history suggestive of typhoid fever.

From the Washington Laboratory there is one case that may be said to need comment, the one reported positive in a dilution of 1 to 160. This was a man, 56 years of age, suffering from arteriosclerosis and hypertension, who had been under observation for years, who had reported for a periodic examination and who had no history of a typhoid-like illness.

Following these rather disquieting results, I sent a questionnaire to the directors of the public health laboratories throughout the United States, and was gratified to receive replies from 37 of them. The results of this questionnaire are shown in *Table II.*

TABLE II.

Replies to Questionnaire from Public Health Laboratories of Thirty-Seven States:

Is undulant fever on the increase in your State?
Yes 14 No 18

Is the diagnosis of this disease made chiefly by means of the agglutination test?
Yes 35 No 2

Has this test been applied by your Laboratory to a group of presumably normal subjects?
Yes 19 No 18

What titre do you consider significant of the disease?

Below 1 to 100	25
1-100 to 1-400	8
Above 1 to 400	0
Undecided	4

About what percentage of your diagnoses, made by the agglutination test, have been confirmed by cultures of the brucella organism from the blood, stool, urine or elsewhere?

None	34
10 per cent or more	3

There are four salient points brought out by this questionnaire: the directors of 14 public health laboratories believe that undulant fever is on the increase in their states; 90 per cent of those replying rely chiefly upon the agglutination test for making a diagnosis; 70 per cent of them believe that a positive agglutination test with a serum dilution of 1 to 100 is significant of the disease; and less than 10 per cent of the laboratories confirm their diagnosis by bacteriological cultures.

The clinical significance of the agglutination test for undulant fever is variously estimated in the literature. Some authors take the position that a negative test is conclusive evidence that the patient is not infected with the organism of undulant fever, while others state that the test is often entirely negative in the presence of the disease. The latter opinion has led to the development of the intradermal test that has been described by Giodarno. Most authors take less extreme positions. But some state that an agglutination reaction with a serum which is diluted 1 to 15 is significant, while others look with great skepticism on these reactions in low dilutions, and insist that the reactions should not be interpreted as specific in dilutions of less than 1 to 100. My inquiries lead me to the opinion that these disagreements are largely explained by differences in laboratory procedures, and chiefly depend upon the so-called density of the antigens that are being used in the different laboratories.

The work of Carpenter, Boak and Chapman would seem to prove conclusively that specific agglutinins appear in human serum as a reaction to the invasion of the *Brucella abortus* through the ingestion of infected milk and that passive absorption of these agglutinins from the milk does not take place. But their findings would also indicate that agglutinins are to be found in a considerable number of human sera in the absence of clinical undulant fever. They conclude that "because of the variable antigenic properties of certain strains of *Br. abortus*, no specific serum titre can be established as diagnostic of undulant fever."

In conclusion, it seems to me that sufficient evidence is presented to cast doubt on the reliability of the agglutination test for undulant fever as a criterion for the clinical diagnosis of this disease, and that conclusive evidence is presented to show that the test as done by our public health laboratories is not properly standardized in its performance or interpretation.

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VALUES IN PUBLIC HEALTH*

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It is not our purpose to take into consideration the economic values of public health programs, or to discuss cost values in relation to particular activities, but rather to evaluate some of the human equations and the public service factors that enter into the administrative relationships of full-time health service. Public health officials of the United States have become convinced that local units for the direct application of modern public health practice are essential to our present-day civilization, and in order that the demand may be met adequately due consideration must be given to requirements for proper personnel leadership, and the many supporting groups must be guided by an understanding of the usefulness of the health official and his service to community life.

PERSONALITY AND QUALIFICATION VALUES

It is an old saying that "you can't fit a square peg in a round hole." The axiom may be applied in the sense that a physician lacking in those elements of personal attainments characterized by Percival in his medical ethics as experience, discrimination, presence of mind, fertility of resources, exquisite tact, capable of making decisions and the power of discretion; and who has given little attention to preparing himself for the vocation or calling in public health, certainly cannot be fitted into the position of public responsibility that accrues to the duties of a health official. Dr. Upham, Dean of the College of Medicine, Ohio State University, said in an address before the Central District Health Commissioners' Conference at Columbus, Ohio, last year,

> "A health commissioner is *ipso facto* a specialist in sanitary science and preventive medicine and should qualify for his position by special study and training in the same manner that other candidates prepare themselves for the other specialties in medical practice."

Certainly public health administrators should hold to this principle, and until that time comes when all medical colleges include definite courses in preventive medicine and public health, the selection of health officers for local units should be made with particular attention to the personal attainments and medical qualifications of the applicant, and a reasonable period of field training at selected centers should be required. Dr. Upham says further in his address,

> "The medical practitioners will respect and support the real specialist in sanitary science just as they will any other specialist, but they are quick to resent the assumption of superiority if it be not founded on proper qualifications."

Health authorities will agree with the conclusions of this distinguished teacher and medical college administrator, and while we realize that all health officers cannot hope to reach the heights in medical and public health statesmanship, yet with the proper incentive for service to humanity the physician with a good medical background, if adaptable, can cultivate his talents by study and perseverance to the point where he can assume with confidence the responsibilities of public health administration and leadership.

ETHICAL AND PROFESSIONAL VALUES

The health officer, because of a broad public relationship, naturally stands out more prominently than the average physician of his community, and he should keep in mind constantly that his moral, ethical and professional conduct is under close observation, and just in proportion as it is above reproach will he be able to reflect the high standards of his profession. He should never lose sight of the fact that first of all he is a physician. In the "Principles of Medical Ethics" of the American Medical Association the physician is reminded that "In choosing this profession an individual assumes an obligation to conduct himself in accord with its ideals." Percival says,

> "The observance of the duties which professional ethics enjoin will soften the manners, expand the affections, and form the individual to that propriety and dignity of conduct which are essential to the character of a gentleman."

The health officer is frequently confronted with the problem of deciding the differences that arise between public opinion and professional standards. It is not rare that the health officer shuns his responsibility in such instances and lets matters drift, and it nearly always follows that he gets into a hole from which he cannot extricate himself. The best course to pursue is to meet such an issue with frankness and sincere honesty of purpose, striving to secure professional accord rather than individual favor on the one hand, and guiding the public mind into an un-

*Chairman's Address, Section on Public Health, Southern Medical Association, Twenty-Fourth Annual Meeting, Louisville, Kentucky, November 11-14, 1930.

derstanding of the health department's limitations on the other. The medical profession is somewhat slowly adjusting itself to the changing conditions in the field of preventive medicine, and the health officer can have a large part in bringing this to full fruition if he will use proper tact and judgment with his physicians, and under no circumstances ever hold himself aloof from professional relationships. All that has been evolved in medical science for the prolongation of human life has resulted from unselfish labor, and many times at great sacrifice on the part of the physician, who, from the very nature of his profession, is a disciple of healing rather than of prevention, and as those of us in the public health field undertake to translate his scientific achievements into preventive practice, we should never lose sight of our obligations to maintain before the public the prestige of the profession, and in no wise to deviate from its high ethical standards. To disseminate public health and medical education we must utilize modern resources for publicity and propaganda, but here, too, there is a limit prescribed by professional traditions and respected customs. To resort to "circus methods" only cheapens the service we are selected to perform, and merely multiplies the list of sideshow, ballyhoo artists. We can only condemn with pity the physician in public position who flouts his professional ethics and lowers his standards by lending his name or that of his department in endorsement advertising of commercial enterprises that regale the public mind with spurious or semi-scientific propaganda. As physicians specializing in public health let us face our obligations to the profession to maintain that dignity in public service that has characterized the physician in private life whose conduct has merited for him the esteem of his fellows.

ADMINISTRATIVE VALUES

It might be said without fear of contradiction that in proportion as he proves himself a successful professional and business administrator of the affairs of the health department, will the health officer merit the confidence and esteem of the governmental authorities and the public generally. Financial management, systematic record keeping, personnel supervision, official relationships, associate or coordinate leadership in community welfare movements and civic responsibilities present problems to public health officials that demand quality in administrative practice if permanence of service is to be secured. Public opinion is the yardstick that measures the importance of our service, and it is not so slow as we sometimes think in recognizing our failures. The budget system of handling finances, if strictly adhered to, will not only save embarrassment, but will assure a prestige that is of inestimable value. No obligation beyond the budget's limit should be incurred unless supplemental funds are definitely available, and these should be accounted for to the contributing agency with the same care and consideration as are those officially entrusted. All records pertaining to the official conduct of the department and relating the activities of the staff should be available for permanent use and kept in such form that they may be accessible for public information without questionable delay. Accurate data which reflect an extensive program giving service to each fiscal division represented in the unit area, if given proper publicity, attract a measure of public support that is useful in convincing appropriating bodies as to the value of the work. Carelessness in keeping records is often reflected in the narrative and statistical reports made by the health officer or members of his staff, and this fact stands out boldly when comparative ratings are made. Visiting public health administrators are impressed when important facts relating to specific activities are forthcoming from the office records, and the reverse is true when only estimates are available, and these largely from memory.

There is probably no feature relating to the duties and responsibilities of a health officer that requires good generalship more than the supervision and direction of the staff personnel. It is not infrequent that a health department becomes wrecked through bickerings and jealousies that should never be permitted to continue beyond the first intimation of their existence. Good judgment, and not partisanship, should decide the issue before recourse is had by contending parties to social or political influences from the outside. The thinking public values the work of the unit as a whole and not by individual prerogatives. A position of public trust should never be taken lightly nor should the obligations imposed be trifled with. A health official's responsibility takes in the whole purview of executive and subordinate activities, and it naturally follows that he must be thoroughly familiar with all phases of the health program.

The health department, by virtue of its legal establishment, should be recognized as a definite governmental agency, and in the administration of its affairs every effort should be made to har-

monize its activities with those of other official agencies, both state and local. The director will minimize his difficulties in securing the support necessary for maintaining his department if he encourages each member of the body responsible for the appropriation of public funds personally to acquaint himself with the various phases of health work being carried out, and this naturally implies visits to the office and to centers where interesting and worthwhile programs are conducted. The visiting official is sure to react to the favorable attitude of those who are the beneficiaries of preventive and corrective work, and not infrequently he will want to show his position in regard to the value of the health department by a few words of public praise. The importance of close cooperation with all governmental agencies responsible for educational programs should never be lost sight of, for it is through this relationship that the greatest number of people is reached. The health officer should never act officiously, but rather should always be prepared for an exchange of courtesies that will insure entree for himself and associates to all places of public assembly.

As a result of intimate contact with every phase of community life the health official is in more or less constant demand for leadership or association in various public welfare enterprises. This is particularly true if he has demonstrated a degree of administrative judgment that has attracted attention. If advantage is taken of the opportunity to coordinate the health program with other civic movements that contribute to betterment in the standards of living, it follows that the health department will grow in favor with that element of citizenship which furnishes the motives and ideals for community progress.

Either active or associate membership in commercial or luncheon clubs, parent-teacher associations or other organizations with constructive programs, will bring the public health administrator in relationship with the groups that favor progressive enterprises. This suggestion is made with the idea of giving health department representation rather than individual recognition, since first consideration should always be given to the promotion of health programs and stimulating interest in the success of the department. Active membership in and regular attendance upon the meetings of medical societies should never be neglected if the confidence of the profession is to be maintained.

PROGRAM VALUES

There is such a variety of services commanding our attention in modern public health practice that it would be impracticable to give consideration in detail to each phase, or to undertake any comparative evaluation. It is important, however, that the health worker keep himself informed in regard to standard procedures in the conduct of the many activities that are included in a well-rounded program, and be able at the same time to adapt his schedule to include special features that changing conditions make necessary. The radio and the press are educating the public even to the remote settlements, and popular demand for protective and instructional programs is steadily increasing. The wise administrator will anticipate the demand, and by methods of publicity that are safe and sensible, guide his public into the acceptance of only those principles and practices in health promotion that have been proven of value. In no case should he perpetrate the folly of a compromise with public sentiment where mushroom health fads and fancies are concerned. To be conservative is better than to be ridiculous. The tree of public health knowledge is not full by any means, but any grafting on of new ideas had best be left to scientific application.

All public health activities for any unit area should be cleared through the health department, and if this is done it will encourage legislative support and reduce the demand for public subscriptions to the many lay organizations that are sponsoring health programs. The sooner all related health programs are merged with the official health agency the better it will be for the public good, as results will come more quickly and with less confusion. Health promotion and disease prevention practice has its origin in the science of medicine, and as rapidly as physicians qualify for administrative positions the responsibility for the conduct of health programs, general or specific, should be placed in their hands. All activities are related either directly or indirectly to the fundamentals of epidemiology, sanitation and public health education, and to be scientifically interpreted and applied they require the training that goes with a modern medical education. The public, which foots the bill, should certainly reserve the right to value the end results of each phase of public health, but the physician, trained in preventive medicine and public health, must chart the course and steer the ship to its destination.

GASTRO-ENTEROLOGY: IMPORTANCE IN DIAGNOSIS*

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With the constantly increasing propaganda in the interest of periodic health examinations, the growing knowledge of the economic value of health and the fact that much known disease can be successfully combated if the condition can but be properly diagnosed and the fitting treatment applied, it becomes very necessary that examinations should be carefully and painstakingly done.

A large proportion of those who seek help of the physician do so on account of something to do within the abdomen. It is, therefore, necessary that a thorough gastro-intestinal examination should be done in these cases. Even in abnormal conditions elsewhere in the body, with no symptoms referred to the abdomen, there is practically always an interlocking interest with the state of the gastro-intestinal tract, since nutrition is important in the process of recovery. It may well be said that every thorough general physical examination must include gastro-intestinal study.

Gastro-enterology had as its probable beginning the classical work of William Beaumont, and his experiments in gastric physiology and the action of hydrochloric acid in the case of Alexis St. Martin. The observations were incorporated in his book, "Experiments and Observations on the Gastric Juice and the Physiology of Digestion," published in 1833 and, a few years later, in the work and contributions of William Brinton and his books, "Diseases of the Stomach," "Diet," "Gastric Ulcer" and "Intestinal Obstruction." Today, this branch forms one of medicine's most important ones in view of the many diseases to be found within the alimentary tract, as well as on account of the symptoms referred there by remote pathological states. The whole province of health is dependent upon the matter of nutrition, which process is intimately associated with that of proper elimination of toxic waste products from the bowel. The health-state in its broadest sense is absolutely dependent upon the integrity of the gastro-intestinal tract.

To secure a proper physical perspective every part of the body, every system, should be carefully studied to determine the nature of symptoms, the source or sources from which they emanate, their causes, and what may be done to relieve them. Did the body and its symptoms obey the laws of mechanics and mathematics it would probably be much easier to answer these questions but, unfortunately, symptoms are inconstant and signs are not unfailing; and many of them are referred to regions far remote from the source of their origin.

Among symptoms of other conditions referred to the abdomen and simulating gastro-intestinal disease may be mentioned the vomiting of cerebral tumor and abscess, pains and digestive disturbances due to focal infections in mouth, throat and para nasal sinuses, intestinal crises due to thyrotoxicosis, pain in angina abdominalis, diaphragmatic pleurisy and pneumonia.

At times, coronary thrombosis has its pain referred to the abdomen with symptoms such as excruciating pain, tenderness and rigidity in the upper abdomen, nausea, vomiting and slight jaundice, so suggestive of some acute intra-abdominal trouble that it is sometimes most difficult to distinguish this condition from that of gallstone colic or perforation of gastric or duodenal ulcer, and surgery has been done in some such cases before the true nature of the trouble was revealed.

All are familiar with the frequency with which the gastric crises of tabes dorsalis have been confused with some gastro-intestinal or other intra-abdominal trouble, and the many surgical operations which have been done in this condition on many parts of the abdomen, without relief. Often it is not until changes in pupillary, patellar and Achilles' tendon reflexes are detected, some ataxia possibly has developed, and blood and, perhaps, spinal fluid examinations are done, that the true cause of the trouble becomes known.

The digestive upsets and interferences described by Alvarez as due to emotional instability are of common occurrence, but it is by no means always easy to differentiate these functional disturbances from some true pathologic states of similar nature.

Renal calculi, neoplasms, ureteral twists and adhesions, and pyelitis are frequently mistaken

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for digestive tract trouble until cystoscopy, ureteral catheterization and roentgenograms reveal the underlying cause of the supposed digestive upsets.

Mistakes in the diagnosis of appendicitis are often due to the fact that such conditions as right-side inguinal hernia, pyelitis, salpingitis, ectopic pregnancy, renal colic and lobar pneumonia with diaphragmatic pleurisy have their pain referred to the right lower abdominal quadrant.

Diabetes mellitus may produce symptoms suggestive of gastric ulcer; circulatory failure with portal stasis may simulate chronic gastritis and, at times, become so intense as to suggest even acute hepatitis or cholecystitis.

Acute diarrheas, aside from those of food intoxication or bacterial or parasitic origin, may be due to pernicious anemia or uremia with renal insufficiency, and hyperthyroidism may be responsible even though no apparent disease is present in the gland. In this condition only the recognition of an increased basal metabolic rate, together with other clinical symptoms of the disease, will afford a clue to the true pathological background of the diarrhea.

On the other hand, troubles due to or located within the digestive tract, may so refer their symptoms as to make it somewhat difficult to determine the cause of the trouble. Many headaches (migraine in type, periodic, occurring during the night or in the early morning with nausea and prostration and relieved by purgatives), as well as dizziness, transient visual disturbance, languor, easy fatigue, nervousness, melancholia, mental confusion, neuro-circulatory disturbances, toxic psychoses, convulsions and some skin manifestations, such as urticaria, pruritus and acne, can be properly attributed to some form of gastro-intestinal toxemia, the result of biliary tract stasis with liver tubule infection, chronic constipation or intestinal infestation by ameba or other form of protozoa, hookworm or tapeworm. Relief is afforded when the true nature of the trouble is found and the proper treatment instituted.

There is much to indicate that both high and low blood pressure, in some instances, may be due to or influenced by the gastro-intestinal tract and Castex reports both of these conditions, as well as renal diabetes and renal lesions with hyperpiesis, as often due to *Entameba histolytica.* In such instances favorable response follows thorough amebicidal measures.

Pernicious anemia and many secondary anemias are now regarded, by many, as being of gastric origin or influenced by gastric activity. Pernicious anemia is considered to be the result of absence of the "intrinsic fastric factor," described by Castle and his co-workers; and the secondary anemias are believed to be due to insufficient or unbalanced food. At times, it is very difficult satisfactorily to distinguish between these two types of anemia and between pernicious anemia, sprue and some cases of pellagra.

A recently reported series of cases of nonsuppurative deafness with tinnitis aurium and dizziness, from circulatory disturbance caused by pancreatic insufficiency and accompanied by liver tract stasis, was markedly improved or cured by the administration of pancreatic extract. Good biliary tract elimination was also obtained.

Gastro-intestinal examinations should make use of roentgenology, the clinical laboratory and all other special methods which may be needed.

The practice of medicine carries with it much opportunity for good. Those upon whose shoulders the mantle of Hippocrates falls bear a heavy responsibility for all to whom they are called to administer. Almost daily, there are being transferred from the realm of art in medicine former ideas and beliefs which through proven experiments and study become accepted as scientific facts. To administer intelligently and helpfully, diagnosis is first necessary, and correct diagnosis can come only through the studious interpretation of a careful and painstaking examination. The examination should always be as thorough as conditions will permit, should be seriously done, with sufficient time. And but few examinations can be considered well done which do not include the gastro-enterological tests.

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THE ADVISABILITY OF A REVISION OF DERMATOLOGIC NOMENCLATURE*

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Ordinarily, nomenclature is not given much thought. A few interest themselves in terminology and its companion subject, taxonomy, but for the majority of us, these subjects have an academic tinge that is foreign to our practical thoughts. Yet from a scientific viewpoint, nomenclature is of great importance. Clear cut designations prevent misunderstanding and confusion; an involved terminology with many synonyms becomes not only a mental burden, but a source of misunderstanding. In terminology, medicine has not followed the biologic sciences. Medical terminology has developed without restriction, while in the biologic sciences, terminology has received serious consideration leading to revisions and codes of nomenclatures. Perhaps, in clinical medicine, the need of an authoritative terminology is not so great as in the pure sciences; otherwise, no doubt, the question would have received more discussion than it has. Up to the present, in medicine, only in gross anatomy and bacteriology have definite revisions and codification of terminology been accomplished.

But the great growth of clinical terminology is more and more attracting attention. The rapid increase of knowledge in medicine has obscured such apparently subordinate questions as that of nomenclature; though it is now being realized that nomenclatural difficulties demand attention.

In our specialty, this question of nomenclature is obtruding itself. Dermatology, more than other medical disciplines, invites and nourishes a luxuriant terminology. Ours is an objective specialty and objectivity favors fine spun distinctions, and these clinical distinctions are further enhanced and multiplied by the comparative ease with which we can study pathologic changes. These two factors have played a great part in the large number of recognized dermatoses, and with them, naturally, the expansion of terminology.

MacLeod enumerates several ways in which our nomenclature (and this applies just as well to other specialties in medicine) has developed many terms, and particularly many synonyms. In the first place, there are no rules of nomenclature, and the original name for a dermatosis is a matter of choice of the first describer. The name may be in Latin or Greek, or in the language of its originator; it may be descriptive of the clinical features or of the pathologic architecture; it may be meaningless or fanciful, except as its definition defines it; or it may be an eponym. Only in those instances where the name is indicative of the etiology and is in a classical language may we say that the disease has been satisfactorily designated.

The result of this haphazard method of naming dermatoses need not be detailed at any great length. Each of you, without doubt, remembers the difficulties of your initiation into dermatologic terminology, and I daresay even now, when familiarity has bred ease there are times when you wish our specialty were less encumbered with names. In preparing papers for this program, I wonder whether you have not felt as I have more than once, that a simpler and a standardized nomenclature would have more smoothly paved your bibliographic road. No doubt, many of you have felt that you have missed important articles because they were entitled with some synonym that was unfamiliar to you. I mention this because it has been my feeling more than once. Even diligent, conscientious search of the indexes does not guarantee a thorough review of the literature, mainly because our terminology has become so complex. It is trivial, perhaps, to advance as an argument for a revision the mental burden involved in learning and retaining a large part of our nomenclature with its numerous synonyms, but it ought to be mentioned if only to add a shadow to the many high-lights of the picture.

Naturally, the most important argument that can be advanced for a revision of nomenclature is that the present nomenclature creates confusion. Upon this point, I have no direct evidence, but I would judge from the remarks of MacLeod and of Zeisler that back of their wishes for a standardization of terminology is the thought that our present designations are confusing in some cases, at least. It would seem that such a probability occurs when we consider the number of synonyms in some of the important diseases. For example, Herczeg, in his recent article in the *Zentralblatt*, stated that he was able, without special effort, to collect some 4,000 dermatologic designations; the large majority of which must be synonyms. To be specific, this author found 25 synonyms for lupus

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erythematosus, and 13 for granuloma annulare. In a recent review of subcutaneous fat necrosis, Epstein and Barash began their paper by enumerating 20 synonyms for this rare disease. Herczeg, again, discusses the confused terminology of the group of keratoses, and as a horrible example, I copy here his enumeration.

Keratosis follicularis Brooke
Keratosis follicularis spinulosa Radcliffe Crocker
Keratosis follicularis spinulosa Unna=lichen pilaris Devergie
Keratosis follicularis spinulosa decalvans Siemens
Keratosis follicularis spinulosa Barrio de Mednia
Keratosis follicularis vulgaris Hidaka
Keratosis follicularis acuta Hidaka
Keratosis follicularis lichenoides Hidaka
Keratosis follicularis amiantacea Kiess
Keratosis follicularis squamosa Dohi
Keratosis follicularis in cutem penetrans Kyrle
Keratosis follicularis Weidenfeld=papuloverrucous neurodermitis Kreibich
Keratosis follicularis sclerotisans Iwanow-Tischnenko

Three of these designations are old; the others quite new.

What applies to the group of keratoses, applies, I believe, with more or less force to several other groups of dermatoses. It hardly seems necessary to elaborate the point further. I feel that the majority, if not all, will agree that dermatologic nomenclature contains either potential or actual, probably both, elements of confusion. I also venture the assertion that it is vain to expect spontaneous simplification.

The question now intrudes itself: Can anything be done about it? Of course, something can be done; we are ingenious enough for that. But any revision of nomenclature must be based upon a plan that is feasible and in which the effort balances the result.

Let us see what has been done in the more fundamental medical disciplines. The anatomists, as you know, revised the terminology of gross anatomy in 1895 (Basle revision). This revision was subjected to considerable, perhaps, deserved criticism, but has gradually won its way, and without doubt has justified itself. But it should be realized, as suggested to me by Prof. Keiller, Head of the Department of Anatomy at the University of Texas, that a revision of gross anatomic terms is a very different thing from a revision of the terminology of a clinical branch of medicine. Gross anatomy is a subject of fixed concepts and unchanging structures. Revision in this case can be final. Not so in a clinical branch, such as dermatology, where concepts change and where occasion arises for new terms and for alteration in old ones.

Bacteriologic nomenclature has undergone a recent revision. Judging by what I have read, I should say that there is some disposition to criticize the revision, and certain not hearty acceptance of it. But this change is of too recent origin to discuss its results. It is mentioned chiefly to show that one group of scientists intimately connected with medicine has had the vision and courage to undertake a revision of their nomenclature. This move had its origin in America.

Zoologists for years have recognized the importance of simple, authoritative and unequivocal terminology. In zoology, there is an International Committee on Nomenclature which has revised the nomenclature. This committee, however, is a standing committee of the International Congress of Zoologists and reports at the Congress which meets triennially. Decisions of this Committee, when ratified by the Congress, become authoritative. Hence, in this science there is regulation, so to speak, of terminology. It is the feature of constant supervision, yet allowing for revision of nomenclature that changing concepts demand, that appeals especially to me.

It is my belief that a plan such as the above would prove of immense value to dermatology. Now that International Dermatologic Congresses are held every fourth year, there is an ultimate court whose decisions would carry the weight of authority. Following this plan, the procedure for a revision of our nomenclature would begin with the creation of a standing committee on Nomenclature as an appanage of our International Congress. The first task of this committee would be a revision of present terminology. Having accomplished that, it would then function to decide questions of nomenclature as they arose. Its report to each International Congress when ratified by that body would be authoritative. In this way, provision is made for those nomenclatural changes that must inevitably occur in a dynamic specialty such as ours.

It is beyond my scope to discuss the details of revision. There have been some suggestions in regard to changes in nomenclature, but I feel wholly incapable of evaluating them. Thus, one

may read of proposals entirely to recast our terminology. For instance, a binomial system has been or may be advanced. Copying from the code of nomenclature of the pure sciences, for example, we might designate the group of tuberculosis of the skin with the substantive Kochia (analogous to the terms Brucella, Leishmania, so forth) and add appropriate adjectives. Thus Kochia colliquativa would displace tuberculosis colliquativa,=scrofuloderma. But if I may venture a personal opinion, I should say that any radical recast of terminology would meet with failure; first, because it would be too confusing, and second because there would be too great conflict with other clinical branches. It seems to me that the wisest course would be a conservation of our present terms which are so woven into the history and concepts of dermatology that to displace them would create chaos. Actually, such a revision as I contemplate goes no further than officially to designate a term for each of the recognized dermatoses. Future contingencies are provided for by the plan as outlined.

Were such a revision put into operation, it is difficult to say just what the immediate effects would be. Naturally, I believe the ultimate result would be of enormous value. The immediate consequences, however, might very well be a period of confusion. Adjustment to such a change could not be accomplished overnight. Nevertheless, I doubt that the period of adjustment need be long or confusing. It is hardly to be doubted that medical editors would put the revision into effect and in a short time textbook authors would have revised their present designations where necessary. Thus teaching, at least so far as terminology is concerned, would be standardized. This guarantees the future since in time the new recruits to our specialty taught in the official nomenclature will displace the present personnel.

In conclusion, this seems to cover most of the important points, and I do not care to encroach upon your time for a more extended discussion. In fact, a brief discussion at present serves the purpose which I had in mind in choosing this subject, namely, to stimulate your thoughts upon it and through you to stimulate others, until a discussion is provoked that will settle whether or not we shall have a revision of our nomenclature.

HAS UROLOGY REACHED THE PLACE IT SHOULD OCCUPY IN RELATION TO GENERAL MEDICINE AND SURGERY?*

By WILMER L. GRANTHAM, M.D., F.A.C.S.,
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During the past twenty-five years great changes have been made in all branches of medicine and especially is this true of urology.

When we visit urological clinics in the larger medical centers and watch the truly remarkable work and technical skill being demonstrated, it proves that our specialty has reached a mechanical perfection that cannot be surpassed. No branch of medicine excels, it is doubtful that any can equal, in scientific accomplishments, the advance of urology during the past decade. Urology is an exact medical science. McCarthy states that it is within 5 per cent of being an exact science from the standpoint of diagnosis. The Mayo Clinic claims that it is within about 3 per cent.

The urologist was the first to use routine blood chemistry as an aid to diagnosis. We soon added renal function, colorimetric tests, x-ray study of the genito-urinary tract, ureteropyelography, cystography and seminal vesiculographic visualization of these structures with true mathematical precision. From the patient's standpoint, however, a diagnosis of an obscure urological condition is not a simple matter in a large number of cases. Unfortunately, many sufferers have reflected obscure symptoms, simulating pathological conditions far removed from the genito-urinary tract.

There is scarcely a domain of medicine and surgery with which urology has not its relation. Its reverberations in the various systems are well recognized. The general practitioner may treat a patient for supposed nerves. He may refer this patient for gastro-intestinal study, or, as is frequently the case, refer him to a general surgeon, who removes a perfectly innocent appendix, or possibly a gall-bladder which is "off color," with the patient's symptoms continuing as before. Finally, as a last resort, a urological study is instituted, and the trouble located where it had lain from the start. Such cases, though not common, occur all too frequently in every city and town. The general practitioner and

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general surgeon need education along these lines. We should be the teachers.

There was a time when the opinion of the specialist was regarded as the last word. We accepted his pronouncements with a reverence that was absolute. The day of the autocrat is over; we have learned to accept with considerable reserve the dynamic utterances of the so-called specialist, no matter what his field may be, unless he knows something other than the technicalities of his specialty. He must be familiar with conditions which might simulate diseases of his chosen field. He must make himself familiar with the history and symptoms of the patient as a whole. In this connection I wish to touch briefly on an all-important and vital point in regard to the relations of urology to general surgery, which is: Is the urologist the one best qualified to perform urological surgery, or is the general surgeon to continue to usurp this field? Dr. Scherk states:

"The oft repeated statement heard in hospitals and at conventions that we urologists are not surgeons, and that certain major surgical procedures had better be left with the general surgeon, should be refuted by the splendid work already accomplished."

Caulk reports that during a survey of a series of 22,148 kidney operations performed by urological surgeons over the entire country, there was a mortality rate of only 3.8 per cent. These results stand out in striking contrast to the mortality rates given previously by leading American institutions where like operations were performed by general surgeons.

The trained urologist is the only one qualified to do the highest type of urological surgery, as well as reduce the necessity for it. The time has come when we should class ourselves as urological surgeons, both to the profession and the public as a whole, and by the excellence of our ability, both demand and command their respect.

Some general surgeons are still performing exploratory operations for kidney pathology. Such practices are common. I am not willing to admit to myself or to others that there exists a general practitioner or a general surgeon who would willingly advise or perform an operation on his patient unless, in his judgment, it would be for the patient's best good. Therefore, if we urological surgeons wish to do the things that properly fall within our specialty, we must first do them better than anyone else can do them. We must do them sufficiently better than anyone else can do them so that when the hospital staff meets for its regular examination of mortality statistics, our end results will stand out conspicuously better than the results of the others. I say it is our duty to ourselves and to medicine as a whole to lead the way.

Secondly, and I feel this to be all-important, we must carry on an educational campaign among the members of our profession. This should be a regular part of our work. First, this campaign should start in the medical schools where urological surgery and urology should be elevated to the place it properly should occupy, as a distinct specialty in our school curricula. At the present time, forty hours to students during their senior year is about the maximum amount of time allotted to urology as a specialty, and a large portion of this time goes to venerology. I ask you, what can we expect to be the attitude of the average graduate when trained to thus evaluate urology and urological surgery? Third: Our efforts should be bent toward establishing at all hospitals an efficiently manned and equipped urological service. In the smaller hospitals the urologist has great difficulty in making a complete urological examination due to lack of facilities. The equipment for performing this work is very expensive and the hospitals, as a rule, will not provide sufficient equipment to allow a complete examination. This leaves the urologist with the alternative of purchasing his own equipment or moving to a larger town.

Dr. Hess states in a recent summary of urological progress:

"Today the general hospital which does not have a well developed department of urology associated with its other departments, directed by a competent urological surgeon, is not meeting modern standards. The department should not be a subdivision of general surgery. The urologist should do his own operating. He should be so trained that he can carry the urological patient through from start to finish, with due respect to the assistance due to be rendered him by all other departments of the hospital."

It is within the memory of many of us when urology was unknown as a specialty, and a much shorter period that it was given a place in the medical colleges and hospitals. Even at this time it does not hold the place it should in many of our hospitals. This is especially true

of the smaller hospitals and in the smaller medical centers; and those of us who are so fortunate, or unfortunate, as the case may be, to be located in the small center, feel this possibly more than those located in the larger centers. While our services are needed by the general surgeons in order that they may make proper diagnoses, yet they often take chances rather than turn cases over to those who are better prepared to take care of them.

The days of the Murphys, Ochsners and Oslers are days of the past. They are gone, never to return. It is true that there will always be certain men who will stand out in the community in which they live and practice. The day of the single individual is over. Today it is group medicine in some form or other; it is immaterial what form it takes. The fact remains that in this day no man can master all of medicine. Do not infer that I mean that the day of the general practitioner is over. The general man was never in greater demand nor more sought after by patients than he is today. People today are constantly seeking knowledge of themselves, and the reason why the cults and isms flourish so luxuriantly is that medicine is not taking advantage of its own discovery. The time has arrived when a better understanding is necessary between the general surgeon, the general practitioner and the urologist. All hospitals should have a distinct department of urology, just as the eye, ear, nose and throat, and other specialties have, and it rests with the urologist to bring this to pass.

Medicine is an art. Urology is an art. We are university men. Let us live up to this standard, namely, that our knowledge is universal.

I repeat again, a large portion of the fault lies with urologists for the mistakes and misunderstandings which exist. Let us not strive, therefore, to become individualists, but constantly seek to lend a helping hand to practitioners of the other branches of medicine with an attitude of respect for their position and knowledge, and a humble realization of our own shortcomings. And, lastly, let us continue to be self-critical and determine that each succeeding year we shall do better work than we have done during the year behind us. Let us keep our standards high, and each year raise them higher.

THE PROPER EMPHASIS IN EDUCATION*

By Robert Wilson, M.D.,
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I do not propose to discuss the age-old and still disputed question, "What knowledge is of most worth," but to consider briefly the purpose of education and to inquire if our educational methods, academic and technical, properly accomplish that purpose.

The human mind is not a mere storehouse for facts, but an instrument to make facts dynamic, to convert this raw material into the force of thought, and the aim of education is to make this instrument as efficient a machine as possible. The acquisition of knowledge, therefore, primarily is a means to promote thinking, but thought itself becomes productive and by it knowledge grows to yet larger proportions, but "acquiring is always secondary, and instrumental to inquiring," as Dewey puts it. And long before Dewey, another scholar, John Hales, an Oxonian of the Seventeenth Century, and "one of the clearest heads and best-prepared breasts in Christendom," had expressed the same thought:

> "I comprise it all in two words: what and wherefore. That part of your burden which contains what, you willingly take up. But that other which comprehends why, that is either too hot or too heavy; you dare not meddle with it. But I must add that also to your burden, or else I must leave you for idle persons; for without the knowledge of why, of the grounds or reasons of things, there is no possibility of not being deceived."

Are we not still guilty of the same fault? Do we not mistake the means for the end and attempt to fill the mind with a heterogeneous mass of facts, sometimes very ill-assorted, and call it education? A process which too often clogs the machine and interferes with its smooth and effective operation. We have concerned ourselves too much with the content of courses, with special requirements for special ends, and with the number of classroom and laboratory hours, the result of which apparently has been to delude our pupils into thinking that education consists in obtaining credit for a definite number of so-called units, a term which is used to express the time spent in classroom and not the quantum of information acquired. With the emphasis which is laid upon this artificial standard it is quite natural that students become "possessed by a

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superstition which worships the symbols of knowledge instead of the knowledge itself." It is not surprising that when we ask a student who has been trained under such a mechanical system his reason for making a certain statement he will reply in all probability by quoting an authority instead of attempting a rational explanation.

It is time, I think, that we should set ourselves seriously to the task of correcting this faulty method and endeavor to lay the chief emphasis where it should be laid, that is, upon making the student realize that the mere possession of knowledge is less important than the ability to use it in constructive thinking and in its application to the arts of living. But this realization is impossible unless his teachers themselves first have a just comprehension of this basic truth and modify the prevailing methods of instruction.

Before discussing the medical curriculum, I wish to refer to two academic studies, one chosen from the optional group and one from the required, to illustrate specifically what I conceive to be faulty emphasis. History usually is considered of very little value save as a means of pleasurable relaxation for those who have a fancy for it, and it must be admitted that in the main this is largely true. When I asked one of my students why he liked history the reply was that he enjoyed reading about conquerors and wars. It was not history that he liked, but romance; real history he had never studied. It had never been presented to him that history is a study of human behavior on a grand scale, and that it might have a meaning and a practical value; that the past is living still in the present, and that only by understanding the past can we reach a comprehension of the events and institutions of the present. If this be true, the study of history might be made to possess a real value for the medical student, for modern medicine cannot be comprehended without a knowledge of its history, and medical history is only a part of the history of civilization and culture. The reawakening in medical thought was but one phase of a widespread reawakening, or rebirth, and Paracelsus, Vesalius and Harvey, Luther, Gallileo and Copernicus were but varying expressions of the same mighty wave which carried civilization to a higher intellectual level.

Viewed as a series of isolated events historical knowledge is sterile; from the viewpoint of the interpretation of modern life and its institutions it becomes vital and fruitful. It is fundamental to a knowledge of ourselves and our civilization.

Biology is one of the required pre-medical subjects and, therefore, perhaps, concerns us a little more intimately. The purpose of biology is to supply information regarded as essential to the study of medicine, but something more than the mere acquisition of facts is needed and the student who has complied in all particulars with the letter of the requirements may still be unable to think in biological terms. He may have some knowledge of the vegetable cell, of bacteria, of some of the higher forms of plant life, of the ameba and of the anatomy of the frog gained by dissection, and yet fail utterly to comprehend the significance of biology as interpreting human life. A student confided to me that all he got out of his course in biology was some facility in handling frogs in the laboratory of physiology, and I suspect that his experience was not unique. While it is not the intent that the pre-medical course should be exclusively a course in applied biology, it should be sufficiently broad and comprehensive and sufficiently purposive to enable the student to understand man as a biological unit, and to afford material for constructive thought in the special field of biology in which his life will be spent. This is not accomplished by the more or less haphazard way in which the subject very frequently is taught, which gives the student only scattered fragments.

It may be contended that the science subjects should be taught as "pure science," which means, if I am not mistaken, that no attention should be paid to any possible practical application. But in the pre-medical course the complete dissociation of knowledge from its use I believe materially reduces its value, for the whole purpose of the study is use and application.

The principle for which I am contending may be illustrated by a story told about Faraday. When he demonstrated his discovery of electromagnetic induction to Gladstone, the statesman showed no interest in it. "What is the use of it, anyway?" he asked. "Some day, sir," replied Faraday, "you will be able to tax it." The practical value was already in the mind of the scientist and he made use of it to instruct and to awaken interest. This course should be followed in our teaching. Pure science concerns itself, it is true, solely with the acquisition of knowledge for its own sake, but knowledge has a purpose, and that purpose is to enlarge man's comprehension of himself and his surroundings, and

to contribute to the safety and comfort of living. Pure science, therefore, always is eminently purposeful. If the pre-medical sciences are to be taught effectively, direction should be given to the student's thought; he should understand not only what he is studying, but the bearing it has upon man, organically, psychologically and sociologically.

As a passing thought before leaving the pre-medical field, we may stop a moment to ask if we do not lay too much emphasis upon the distinction between the sciences and the humanities from the viewpoint of their educational value. If all knowledge can be and should be used to improve the quality of our thinking, the difference would seem to me to resolve itself into one of degree only; and instead of discussing the sciences versus the humanities it would be more reasonable to seek a judicious combination.

When we come to consider medical teaching we find ourselves committing the same error of sacrificing *in*quiring to *ac*quiring, of neglecting the *why* for the *what*. The over-crowded curriculum may make this almost unavoidable, but the result nevertheless is that the mental machinery becomes so clogged with facts that the machine will not function as a thinking instrument. To overcome this we try to reduce the number of hours so that the student may have time for reflection, but very little will be accomplished by this procedure unless he has been taught how to reflect. The medical curriculum is not so conducive as it might be to the cultivation of habits of thought. The custom of treating the subjects taught in the first two years as pure sciences, without the student's being able to detect any connection between them and bedside problems, has dissociated these subjects too completely in his mind from the real object of his labors. When he reaches the advanced years of his course he finds himself confronted with the necessity of thinking, and of thinking in terms of anatomy, physiology, pharmacology, pathology, chemistry, physics and biology. For the first time the use of it all becomes clear, but he finds the habit of learning by exercise of memory instead of rationally is hard to break. It would be much wiser, I believe, to establish clinical contact very early, not burdensomely but sufficiently to illuminate the so-called preclinical subjects and give them a meaning and a purpose. Instead of cutting medicine up into bits and teaching each part separately, it should be treated as a whole, and medicine as a whole is applied science. When the student begins to study human anatomy he has begun already to study medicine, and because medicine is applied science he cannot consistently study anatomy entirely as a pure science. It would be more correct to say that medicine is the application of many sciences to the problems of disease, and the sooner this point of view is presented to the student the sooner will he begin to acquire the habit of thinking diseaseward. If trained in this manner he will enter into the clinical years already possessed with a proper understanding of the *why* of those studies called preclinical and with the habit formed of correlating what he has acquired with bedside problems.

Whether research is a proper function of the medical school, and whether the student should be given a contact with research, have been discussed many times pro and con. But the line of thought I have been following gives what seems to me to be the logical answer. If teaching should be directed toward the end of developing the rational faculty, of cultivating the inquiring habit of mind, then research should occupy an important place in our college work. This does not mean that every teacher need be a research man in the highly technical sense, but that an atmosphere should be created in which the spirit of inquiry prevails, inquiry into the validity of old things as well as the search for new things. That some serious research be carried on in one or in several departments is eminently desirable, for not only is the teaching authority of the college thereby enhanced, but to the student it affords an intellectual stimulus of the greatest value. And the teacher who does some individual research is a man able to speak with the authority of one who knows, or what is equally important, of one who knows that he knows not. Such an attitude always has been impressive: "And they were astonished at his doctrine for he taught them as one who had authority and not as the scribes." The student should be encouraged to work out simple problems under guidance and thus form the habit of thinking out things for himself instead of accepting them upon the authority of others, for only by acquiring "the grounds and reasons of things," to use again the expression of John Hales, can he guard himself against the possibility of being deceived.

THE EVOLUTION AND PRESENT STATUS OF NEUROPSYCHIATRY IN ITS RELATION TO THE PUBLIC HEALTH*

By WALTER L. TREADWAY, M.D.,†
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An approach to the subject of the relationship of neuropsychiatry to public health should involve a discussion of the evolution of methods adopted by communities to meet the needs of the socially misfit, or illy adapted individuals, and of the evolution of psychiatry as a special branch of medicine. It is a trite, but nevertheless a true observation, that society has always demanded of individuals a certain discharge of obligations in behavior and conduct and has always dealt, in one way or another, with departures from the more or less liberal standards which it has seen fit to adopt or maintain. The behavior and conduct of an individual and the adjustment of his body to his environment are all intimately bound up with that complicated maze of neurological function which associates, correlates, and synchronizes the various activities of the several organs of the body, and of the conscious or mental life.

It is appreciated that any betterment in the social, moral, economic, or commercial conduct of a self-governing people springs, not from the mind of any one person, but from the congregate opinions and wishes of generations in community groups. Notwithstanding the sudden emergency of so-called reform movements, they are always based upon a framework that is deeply rooted in a background of tradition and community practice.

THE ENGLISH POLICY

A regular system of providing relief from the public treasury for that group of the population which, through adversity or other causes, cannot cope with the requirements of community standards, has been in continuous existence since early in the Seventeenth Century. The development of the so-called "English poor law" was an effort in this direction, and was an outgrowth of many similar attempts made in the Sixteenth Century, both in England and on the Continent. The English method, however, is the only one that has survived, and its continued existence is peculiar to that country.

In London, steps were taken to meet the situation in a logical manner. Those seeking aid were divided into three groups: first, the succorless poor children; second, the sick and helpless persons; and, third, the sturdy and able-bodied vagabonds. The first group was provided for at Christ's Hospital, which served as the background for the future evolution of orphanages and child welfare activities. The sick and helpless were cared for at St. Thomas' Hospital, or, if able to leave the institution, were given a license to beg. Thus the principle of establishing public hospitals came into being.

For the third group, a plan was devised by which all vagabonds were gathered together in one place and occupation provided for them. The Crown set aside a building for this purpose in 1553, and Bridewell, one of the first correctional institutions, originated, and furnished the background for the development of future workhouses and reformation methods.

The Bethlehem Hospital was utilized for the care of the insane, and was considered for a time a separate and distinct institution. However, this separateness in administration existed only for a short period, as the reports of those in charge show that Bridewell and Bethlehem Hospital were both administered by one group of men. Thus, it will be seen that in the first public relief policies the mentally disordered population was intimately related to the administrative problems involved.

STATE AID POLICIES

Up to this time, all the funds for relief measures had come largely from voluntary contributions. Efforts were made on the part of towns to coerce their inhabitants to contribute money for this purpose, and many plans were devised for compulsory giving, with only sporadic degrees of success. Finally, and with reluctance, the state imposed a direct tax for the support of its charges. In 1601, a regularly assessed poor rate became compulsory, and thus the foundation principle was laid of state aid to the poor, and of state aid of charities in general.

The evolution from local custom to national practice fairly illustrates the growth of a method which later became crystallized in the Acts of Parliament. Its growth was natural, practicable, and therefore abiding. That these principles, with respect to relief from the public treasury, should follow the colonists to America as a part of their political philosophy, was a natural result of their old world training.

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THE AMERICAN POLICY

The early settlers along the Eastern seaboard were familiar with the scourge which vagrancy had brought upon England, and realized that poverty and unwise giving would easily result in pauperism. The "millstone of rate paying" as practiced in England was, evidently, a specter ever to be avoided and shunned. Out of this developed a policy relating to the care of those in distress or in need.

The American colonists were poor in worldly goods, their lives depending upon their slender crops and their ability to build habitations and defenses against the natives. In general, they were a hard-fisted band of workers, intolerant of sloth or any sort of privilege, interpreting the rights of each individual in the light only of the common weal. The stern measures taken by local authorities with respect to the distressed or needy did not accord a measurable degree of comfort or humane care. Their aims, when it came to administering aid or relief, were, first, to avoid the burden, and second, when finally charged, to carry as little of it as possible.

This philosophy of the American people has been handed down from generation to generation, each decade witnessing, however, a steady breaking down of those resistances so far as the public treasury is concerned, until what would have been regarded as intolerable burdens by a past generation would be considered essential and necessary by the next generation.

As the American communities grew older, and their isolation gradually gave way, there was no escape from the constant increase in the number of those, who for various reasons, required aid and assistance. Each community endeavored to dispose of them as cheaply as possible, so that soon the habit of allowing the public to offer terms for their support became a common practice. Thus, little children and aged men and women, "half-witted" boys and girls, the harmless insane, the crippled or maimed, and the blind or deaf and dumb, were alike appraised and their capacity for toil estimated in money value.* The practice of auctioning the poor to the lowest bidder gradually lost ground, however, and out of it arose the policy of indoor relief, or almshouse care.

*Note. The contract price covering the cost of maintenance for these individuals was paid by the local authorities. The price represented the difference between each individual's capacity for self-support, and the ability of a normal individual for self-support. To the present generation such a practice is abhorrent because of the abuses arising therefrom. Yet, on the other hand, there is a somewhat analogous situation with respect to the support of county jail prisoners, when the county sheriff is allowed a specified sum for the subsistence of each prisoner, pocketing the difference between the actual cost of food and the amount allowed for such purpose by the local jurisdiction. Abuses arising from this situation are almost universally practiced in the United States, yet condoned from generation to generation.

INDOOR RELIEF

The practice of supplying indoor relief through local almshouses became almost universal throughout the United States, and for many decades almshouses and jails were the only public institutions housing people who could not provide against adversity, or cope with the customs of society. The almshouses originally built and maintained to shelter and care for the poor and helpless gathered together under a single roof all manner of persons. There were the widowed and the aged who were incapable of self-support; the little children left orphans, or sired by incompetents; the idiot, the epileptic, and the feeble-minded; the deaf and dumb, who were the grinning butt of public ridicule; the maniacs and harmless insane; the lame, the crippled, and the blind. All were gathered together under the same enclosure, sometimes, not always, with separate sleeping quarters. The furiously mad were commonly provided with separate rooms or cells, not for their individual comfort or benefit, but because their ravings made life uncomfortable for those about them.

Admission to such almshouses did not stop with the helpless and worthy ones. Among these were thrown the vagabond, the tramp, the petty thieves and criminals, the vagrant class, the prostitute brought to her lying-in, the drunkard and drug addict, the venereally diseased, the tuberculous, and others with communicable diseases. Public interest was focused upon this situation only because of the increasing drain upon the public treasury. It became obvious, from public demands, that some means must be found to decrease, or at any rate, to stem the tide of, this drain upon public coffers. Thus there began a period of specialization from which evolved various systems and facilities to meet the needs or assumed needs of these various groups.

SPECIALIZATION IN INSTITUTIONS

The first attempt at specialization for meeting the needs of the early almshouse population was stimulated by an insistent demand that the able-bodied pauper, sturdy vagabond, and criminal, should be put to work and made to contribute something to his self-support. In consequence, there developed special facilities to meet the needs of the helpless poor, on the one hand, and for the more able-bodied and sturdy group on the other hand. Thus the evolution of institutional facilities and the public policies

governing aid from the public treasury had their beginnings in what appeared to be two distinct groups: first, the helpless poor or almshouse group, and second, the sturdy delinquent and criminal or workhouse group.

These two types of institutions have been the nuclei out of which, on the one hand, have grown those public facilities now utilized for the care, study, and treatment of the so-called insane, the feeble-minded, the epileptic, and others with manifestations of mental ill health, and on the other hand, there have grown those institutions and public policies concerned with the segregation and supervision of the so-called criminal or delinquent classes. With the evolution of these institutional facilities, and with the development of every policy respecting relief from the public treasury, the mentally disordered individual has arisen as a complicating factor in administration.

THE FIRST PUBLIC INSTITUTIONS FOR THE INSANE AND FEEBLE-MINDED

To the South belongs the honor of being the pioneer in establishing the first institutions from public funds exclusively devoted to the treatment of the insane. The Virginia colony passed an Act, November 10, 1769, authorizing such a hospital at Williamsburg, Virginia. It was opened on September 4, 1775; closed during the War of Independence; and has since been used in accordance with its original purpose. The next public institution for the care of the insane in the United States was established at Lexington, Kentucky, in 1824; the third at Staunton, Virginia, in 1828; and the fourth in that same year at Columbia, South Carolina.

The development of institutions especially adapted for the training and care of the feeble-minded was in part an outgrowth of an effort to educate the deaf and dumb and the blind. The first permanent institutions for the exclusive training of feeble-minded children were established in Massachusetts in 1851, in New York in 1853, in Ohio in 1856, and in Kentucky in 1860.

INADEQUACY OF INSTITUTIONAL FACILITIES

The facilities and means that are now available in the United States for the recognition, amelioration, and care of adverse mental states, or for relieving persons in the incipient stages of mental ill health, show wide variations when different parts of the country are compared. The rapid growth in population, coupled with the necessity for securing immediate institutional provision for those making the strongest appeal, has resulted in the development of piecemeal facilities without regard to an adequately balanced program. Such a growth met some of the communities' needs and left others, and perhaps equally important needs, unprovided for. In consequence, every stage in the evolution of these public facilities may be found somewhere represented in the United States today.

It is only within recent years that any coordinate attempts have been made to develop a program for the care of a State's wards. This coordination was begun through the establishment first of advisory, and later of administrative, control by a department in the several State governments. The programs initiated by these controlling agencies have had to consider previous policies that have often determined local requirements. These agencies have also had to modify or curtail their activities from time to time owing to the dearth of funds available for carrying their several programs into effect. Sometimes the most worthy projects have had to be postponed because of the limited means to finance them. Perhaps this is true of all such agencies, for no State legislature has yet kept pace with the needs of the mentally ill.

Despite this situation, 45.7 per cent of all hospital beds in the United States are devoted to the care of mental and nervous diseases, and 95.4 per cent of these are occupied. Last year, 128,964 new patients were admitted to these hospitals, and 25,445 were readmitted. Approximately 324 persons in each 100,000 of the general population were occupying beds in hospitals for nervous and mental diseases, against 192 occupying beds in general hospitals. Such statistical data give some indication of the important position occupied by mental and nervous diseases in relation to the nation's health. This is all the more impressive when it is realized that approximately 40 per cent of all persons applying for medical advice at public clinics or dispensaries are suffering from some mild form of mental illness.

THE EVOLUTION AND MENTAL GROWTH OF NEUROPSYCHIATRY

The history of neuropsychiatry as a special branch of medicine covers but a short interval of the history of insanity, for mental diseases have existed over a very long period of time. The modern era of this specialty probably dates from 1798, with Haslam's preliminary studies of dementia paralytica, followed by the researches of Bayle, of Delaye, and of Calmeil, who estab-

lished general paresis as a clinical entity. The work of Esmarch and of Jessen, who in 1857 suggested its luetic origin; that of Nissl and of Alzheimer, who established a more accurate knowledge of its pathology; the application of Quincke's lumbar puncture; studies of the spinal fluid by Widal, Plaut, Nonne, and others; together with the Wassermann and collodial gold reactions, finally culminating in the discovery of the organism of syphilis in cerebral tissue, establishes a romantic history of little more than 100 years' observation and study of this single disease.

Esquirol, Pinel, and Charenton spoke disparagingly of the anatomical pathology of mental diseases as late as 1835, although Greding had described as early as 1790 dural thickenings and adhesions, ventricular effusions, and changes in cerebral consistency, as observed at autopsy, and attached great significance to the pineal gland. A knowledge of the histological structure of nervous tissue dates from 1858, when Gerlach laid the foundation of nerve tissue staining by the use of carmine. Such names as Schwann, Henle, Remak, Muller, Purkinje, Meynert, Waller, Cajal, Hortega, Alzheimer, Nissl, and Dunlap are almost synonymous with neuro-anatomy and neuropathology.

The discovery of the cardio-respiratory center by Flourens, in 1842, was probably the forerunner of cerebrospinal localization. The names of Bernard, Hall, and our own Campbell,* of the Medical Department of the University of Georgia; Helmholtz, Wundt, Meynert, Hughlings-Jackson, and Broca, mark a turning point of interest in this particular field. The observations of Fritsch, Hitsig, Horseley, and Ferrier, however, laid the foundation for the present status of our knowledge concerning cerebrospinal localization.

The recognition of the toxic mental disorders as such, dates from the publication in 1852 of an elaborate study of alcoholism by Magnus Huss, paving the way for more detailed descriptions of the alcoholic insanities by Bonhoffer, Magnan, Korsakow, and Kraepelin. Meyer described the traumatic psychoses, and in 1886 Erlenmeyer published the first comprehensive study of mental disorders associated with the use of cocaine, and subsequently a study of morphinism.

Hysteria was recognized and described in 1847 by Brachet, and later by Briquet, Oppenheim, Mobius, Charcot, Janet, Babinski, and others. Paranoia, a term appearing in medical literature for centuries, had its description foreshadowed by the so-called "monomania" of Esquirol and of Pritchard, and by the "partial insanity" described by Rush. Kraft Ebing's description of paranoia did not appear until 1879, and is now seldom used, since Kraepelin's description of the so-called paranoid form of dementia praecox. The names of Hecker and of Kahlbaum are linked with the terms "hebephrenia" and "catatonia," who described these disorders in 1874. The terms "constitutional inferiority," credited to Adolph Meyer, and "psychopathic personality," had their beginnings in the so-called "moral insanity" as described by Pritchard and by Maudsley, and in the "insanity of degeneracy," as described by Morel, Magnan, Regis, Lombroso, Grasset, and Trelat.

Perhaps the most significant phases in the evolution of present day psychiatry were ushered in by the publication in 1899 of Kraepelin's sixth edition of his "Psychiatrie." His descriptions of clinical entities brought order out of chaos. Wernicke's theory on the association mechanism, and the works of Bleuler, Freud, Jung, and Adler awakened an interest and an enthusiasm in psychological mechanisms and psychopathology generally.

Such an approach has been of great value in interpreting the motive and mechanism of various psychological reactions. However, these so-called "psychogenetic philosophies" have sometimes assumed a non-medical, if not an unmedical flavor. In fact, some of the interpretations have been compared with the "magic art of another day."

THE PRESENT STATUS OF PSYCHIATRY

Nevertheless, for the first time in history, a wider interest is now being shown in disorders of the mind by the lay public. Failures, and unconventional behavior and conduct, are being interpreted not in terms of institutional provisions, but in terms of personality factors having behind them mental implications.

The mental hospitals are being called upon for a greater responsibility and function to the community they serve, quite independent of the care of committed cases. Home, school, and other relationship problems are being referred. Demands are being made by educational and health services, by industry, vocational and child guidance agencies, by the courts and penal and correctional institutions, for the services of psychiatry which now reach far out from the institution, away from the distinct working of the psychoses, to interpret the slight deviation from the normal.

*Note. Reflex Phenomena of the Sympathetic Nerve Excito-Secretory System of Nerves.

INDIVIDUAL SPECIALIZATION AND PREVENTION

The present status of psychiatry makes possible the interpretation of departures in social adaptations and adjustments, not in terms of institutional facilities alone, but in terms of individual needs and requirements. The public policies of the future dealing with that group of the population which cannot comply with the liberal standards of conduct and behavior maintained by society, must be influenced eventually by an appreciation that the individual antecedent history and heredity, experiences, and education, and the physical and mental status, may all have a bearing upon the shaping of a personality in a pathological direction.

There is a growing conviction that institutional provision alone is an unwise and an uneconomical method of handling this group of the population. Instead, it is being more and more generally recognized that community sources of these personalities must be uprooted, that mental patients must have early and adequate treatment, that underlying causes of mental diseases and adverse social behavior must be sought by study and investigation, and that means must be adopted to render less threatening the menace of increase in the number of mentally disordered persons.

In this connection it may be significant to mention that the Congress of the United States has recognized that mental disorders constitute a problem of national health, and has established a Division of Mental Hygiene in the Office of the Surgeon General of the Public Health Service. The establishment of such a Division indicates the necessity for awakening the medical profession to a sober and scientific approach to the problems of the causes, prevalence, and means for the prevention and treatment of nervous and mental diseases.

The thought this paper wishes to convey may be summarized briefly as follows: the evolution of methods adopted by communities to meet the needs of the socially misfit or illy adapted individuals has shown that mental disorders have always complicated the administrative problems involved.

The possible solution of this situation is now evolving through the development of psychiatry as a special branch of medicine. This special branch of medicine, because of its knowledge of individual needs and requirements, is equipped to furnish assistance and guidance in the disposition of those various groups of the population who cannot comply with the liberal standards of conduct and behavior maintained by society.

EMPIRICISM AND SCIENCE IN MEDICAL PRACTICE*

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It is not, perhaps, inappropriate in this place to discuss the subject I have selected for the occasion. Situated as this meeting place is, within a few hours' journey of the seat of the first notable educational undertaking and the first medical institution west of the Allegheny mountains, a university that produced some of the most notable medical observers of our early American history, and in the city which has given in recent times one of the outstanding medical scientists of our country, Kentucky and Louisville may well lend themselves to reflections on what empiricism and science have done for medical progress. Perhaps, also, the two hundred miles that separate us here from some of your Southern neighbors may make it a little safer also to open up such an explosive topic.

A year before the close of the Eighteenth Century, in 1799, the Trustees of Transylvania University instituted a Medical Department, appointing Samuel Brown Professor of Chemistry, Anatomy, and Surgery, and Frederick Ridgely, Professor of Materia Medica, Midwifery, and Practice of Physic, thus initiating a School of Medicine, which during its sixty years of corporate existence played a conspicuous part in the early medical history of our country, and which during the forty years from 1817 to 1857 enrolled 6,456 medical students, and graduated 1,881 medical practitioners. Having received in 1780 a grant of 8,000 acres of land from the State of Virginia, of which Kentucky was then a portion, and a further grant of 12,000 acres in 1783, Transylvania Seminary was the first educational effort of the then far western country. The early history of the Seminary was not altogether unlike that of other such institutions in this country in the somewhat colorful contention of different religious sects to control its destinies, and after nineteen years of dispute and the organization of a rival school, a consolidation was effected in 1799 and the University established under the Presidency of the Reverend James Moore, of the Episcopal Church, the Unitarian Director of the Seminary, and the Presbyterian President of the rival Kentucky Academy retiring in favor of the new head of

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the University. Upon his appointment to the first medical professorship, Dr. Brown was authorized to import books and other means of instruction for the use of the medical professors. In subsequent years the University received notable grants of money and lands from the state and interested citizens, and in the period of its greatest activity, from 1820 to 1845, notable sums of money were given to the Medical School for libraries, apparatus, and the museum, and a handsome building (finally destroyed by fire in 1863) was erected in 1839.

Established at Lexington, when that city was the metropolis of the West, the Medical School flourished until changed conditions, occasioned by more favorable transportation facilities by water and rail, increased the population of other centers, and caused a rapid decline of that of Lexington. After 1849, the number of students diminished rapidly until the school was finally closed in 1857.

In this setting a group of quite notable men labored for medical education, according to the best traditions and practice of the day, and some of them in general capability and intellectual endowment would have taken rank with the foremost characters in any of the more favored medical centers of that day.

Samuel Brown, the pioneer professor, a Virginian, after graduating at Carlile College, Pennsylvania, studied medicine for two years in Edinburgh with David Hosack, of New York, botanist and noted physician, and Ephraim McDowell, of Danville, Kentucky, the first surgeon in any country to plan deliberately and perform ovariotomy for ovarian diseases. Brown was not only a physician, but a chemist and mineralogist, and moreover, a man of culture and scientific bent. His alertness in grasping new ideas of value was illustrated by his introduction of vaccination in the West in 1802, before the method had received wide acceptance even in England, and only two years after its first use by Waterhouse in Boston. As early as 1802, Brown had vaccinated upward of 500 persons. His work in this field is notable further by the fact that the virus he used was from its original source, the teats of the cow (quoted from Robert Peter, address, Nov. 5, 1854).

He was succeeded in the Chair of Surgery and Anatomy by Benjamin Winslow Dudley, in many respects the most notable personage at Transylvania, who served as the Professor of Surgery from 1809 to 1850, and in Anatomy from 1809 to 1844. Born in Virginia in 1775, he became a medical student at the University of Pennsylvania in 1805, where he had as fellow students his subsequent Transylvania colleagues, Daniel Drake, John Esten Cooke, and William H. Richardson. After graduation and a brief period of practice at Lexington, he continued his medical studies for four years in Paris and London. To him, more than to any other, was attributable the phenomenal growth of Transylvania's Medical School from 1817 to 1850. Like so many other early surgeons, he was a famous and exceptionally successful lithotomist, his success no doubt having been the result of painstaking preliminary treatment of the patient, a precaution which was rarely exercised by other surgeons. But more original than his work in the field of lithotomy, was his development of a method of judicious and regulated pressure by means of the roller bandage in the treatment of abscesses, inflammations, fractures and aneurysm. The fame of his method was considerable, though his followers were far less successful in its performance. It may, perhaps, be proper to suggest that Dudley in his own way anticipated the comparatively recent method of Bier so widely applied by surgeons of this day. The outstanding achievement of Dudley, however, was his observation that epilepsy may be caused by pressure on the brain, the consequence of fracture of the skull, and as demonstrated by five successive operations, might be cured by trephining (*Transylvania Journal of Medicine*, Feb. 1828).

Among Dudley's associates at Transylvania, the most colorful was Constantine Samuel Rafinesque, in range of knowledge, botanist, naturalist, conchologist, zoologist, geographer, esentographer, physiologist, historian, antiquary, poet, philosopher, economist, and philanthropist, and by profession traveler, merchant, manufacturer, improver, professor, teacher, surveyor, draftsman, architect, engineer, author, editor, bookseller, librarian, secretary, chancellor, and so forth. Doubtful as such universality may appear, it is all literally true, for he admits and states it himself, and, moreover, believed he could have been anything else, for he "always succeeded in whatever he undertook." Such a character could have arisen in no ordinary surroundings. Born in Constantinople in 1784, and after living in Italy and France, he made large botanical collections in America from 1802 to 1805, when we find him returned to France and Sicily, writing various essays, and in 1815 an "Analysis of Nature." Returning again to America in 1818, he was in the following year elected Professor of Botany and Natural History

in Transylvania University. A prodigious collector, worker and writer, his chief contribution to the Medical School was his establishment in 1824 of a botanical garden in Lexington, which contained a notable collection of medicinal plants.

Among the other outstanding individuals at Transylvania, it is, perhaps, unnecessary to make more than brief mention of John Esten Cooke, Professor of Theory and Practice of Medicine from 1827 to 1837, a graduate of the University of Pennsylvania, where he surely did not learn the radical tendencies that enabled him to achieve the world's record of administering to one patient in one day a pound of calomel, nor his obstinacy in resisting the use of quinine in malaria, until in his own illess a military friend prevailed on him to accept his physician's prescription of that drug. Despite his heroic medication and his contracted vision, he long held a conspicuous place as a practitioner in this locality. Fortunately, for Transylvania, he removed himself with Caldwell, Yandell and Short to establish the Louisville Medical Institute in 1837.

Charles Caldwell, another contribution of Philadelphia to Transylvania, was the stormy petrel of the East and West, throughout his long career. After antagonizing Rush and his medical contemporaries in Philadelphia, and closing the door to preferment there by his acrimonious combative disposition, he found a professorial opportunity at Transylvania, already flourishing as a result of the abilities of Brown and Dudley, and ever afterward imagined and widely stated that he alone was responsible for the success of the School. Argumentative, speculative, theoretical, metaphysical, though withal somewhat picturesque, he contributed nothing to medicine but controversies and the founding of new schools. His removal to Louisville in 1837 was no loss to Transylvania. His place was much more than filled by the selection of John Eberle, one of the founders of Jefferson Medical College, but the untimely death of the latter, after delivering his introductory lecture, deprived the School of a promising character.

Nathan R. Smith and Elisha Bartlett, the latter toward the end of his life Professor in the College of Physicians and Surgeons of New York, and Lunsford Pitts Yandell were others among the conspicuous figures of the Medical School, but the premier of them all in vision, industry, and the inquiring habit of mind that may well be designated scientific, was Daniel Drake, who curiously seems to be less appreciated here than others of far inferior abilities. Born at Plainfield, New Jersey, in 1785, his medical studies began in Cincinnati in 1800, and were continued in Philadelphia in 1805 and 1806. He was first at Transylvania as Professor of Materia Medica and Medical Botany in 1817, but he returned to Cincinnati in 1818 and remained till 1822, when he resumed his professorship and the medical deanship at Transylvania (1823-27). In 1830-31 we find him a Professor at the Jefferson Medical College in Philadelphia, in 1831-32 at the Medical College of Ohio, and from 1835-39 a professor in the newly organized Medical Department of Cincinnati College. He accepted a chair, and taught in the Louisville Medical Institute from 1839 to 1849, when he once more returned to Cincinnati, where he died in 1852. Notwithstanding his frequent changes in location, Drake performed a prodigious amount of work, as is evidenced in his "Treatise on the Principal Diseases of the Interior Valley of America." It may be doubted if any other medical work published in this country has shown a greater amount of personal investigation and inquiry. Scarcely a page, certainly no chapter in this, for its time, monumental work is lacking in some personal observation, some surprising inference from reported facts, some communication from medical friends in answer to special inquiry by Drake. Rarely can one find in it acceptance of the extravagant and unsound methods of treatment common in his day, and everywhere there is the evidence of sound common sense and intelligence. His views of the value of emetics, purges, blood-letting and other drastic treatments commonly employed by most of his contemporaries, are especially wise, since he opposed any routine use of such measures, and indicated that their value is only in modification of systemic conditions preparatory to systemic reaction or some form of really curative treatment.

It would require more than all of the time at my disposal to review even the more important of Drake's observations that seem original with him, but I may recall the evidences he assembles in proof of his belief in the kinship of intermittent and remittent forms of autumnal fever (malaria), his recognition of the fact that certain quotidian fevers are merely double tertians (this sounds quite modern), and his accurate estimation, still valid today, of the appropriate dosage of quinine in different types of malaria. In the matter of dosage, it is refreshing to read his comments on the immoderate amounts of calomel, sometimes reaching "criminal limits," given by physicians in his day. Referring to the dosages, he remarks, "they were a revolting absurdity."

Not the least arresting chapter in his book is that on "Miscellaneous Causes of Pulmonary Inflammation," and it contains a mass of information accumulated by himself, derived from his students coming from other localities, and from physicians with whom he corresponded on the effect of the dust of cotton and hemp mills, flour and grist mills, and that of mineral character, such as stone dust, dust of charcoal, and stone-coal and fine sand. He refers also to the varying effect of chemical fumes, such as carbonic acid, sulphuretted hydrogen, chlorine, and the like, and distinguishes between those which exercise only a species of narcotic effect, and those which occasion inflammatory reaction. Even the most modern reader may find something of interest in this chapter on "Inhalation Disease of the Lungs." His brief discussion of asthma contains a number of original observations with deductions often surprisingly accurate in the light of our knowledge of today. Referring first to the various organic diseases of the heart, lungs, and chest, with which paroxysmal dyspnea is associated, he remarks that

"the whole of these cases of difficult and anxious pulmonary respiration have, in past time, by mere symptomatists, been classed together—and ranged under one head—asthma continued or paroxysmal."

Discussing the supposed essential relation of emphysema to asthma, he asks himself why the latter is paroxysmal and concludes:

"I am compelled to admit a form of dyspnea, idiopathic and, of course, not dependent on anatomical lesions, to which the term asthma may be applied. When eliminated from all other dyspneas, its symptoms are as distinctive, and its general history is as peculiar as that of most other functional diseases."

He speculates on the possibility that atmospheric impurities that are found to reproduce the paroxysm may have been the original cause, but feels such a conclusion "would, perhaps, often be erroneous." He cites the case of Dr. Richard Allison, Surgeon-in-Chief in Wayne's Army, who was slightly asthmatic, and could never weigh out even a single dose of ipecac without having a violent paroxysm. He quotes medical friends, who had observed relief of asthma on removing from the country to the city, and he, himself, saw this at Cincinnati. Indeed, he noted that the relief was greatest when the patient went into the lowest and least ventilated parts of the city. In his discussion of the treatment, he recommends change of place, seeking one "which differs as much as possible from that in which the malady originated or returns with violence."

I must be content with these quotations. They suffice to indicate the quality of mind Drake possessed, but they are too fragmentary to show what a cursory examination of his book will show, that he was a man of extraordinary industry in seeking and finding a mass of information by correspondence, from public reports and statistics, and from reading on a wide range of topics which seemed to his mind to have a bearing on disease. He quotes extensively tables showing ranges of temperature, rainfall, geological and topographic conditions in widespread areas, the effects of wind, of excessive heat, of conditions of vegetation, of food, and so forth, and what is more surprising, never allows himself to draw hasty conclusions regarding any of these things, no matter how abundant the testimony. Truly, this man was in mind and method a true scientist.

Of the men who labored in this pioneer medical school, a few had had the advantages of wide and prolonged education preparatory to and after entering upon medical studies at home and in the best schools of Europe, but the larger part had received sparse preliminary education, and only mediocre medical training or knowledge of the sciences. All alike were immersed in active and exhausting practical work. Despite these difficulties and their discouraging situation, in a frontier town surrounded by a scarcely explored wilderness, several of Transylvania's early teachers contributed observations of medical facts of lasting value, and brought to bear a capacity for comparison of data and analysis of their significance that well entitled them to the name of scientists. None of them, strictly speaking, was an investigator in the modern sense of the word, but each in his way belonged to the great body of empiricists or observers who constituted the medical profession of that day, and who assembled a knowledge of facts essential as the basis on which modern science has been erected.

Empiricism is a much misused term, implying in its common modern use knowledge based upon crude observation and practical experience alone. As a matter of fact, the school of Empirics from whom the name is derived, was founded about 280 B.C. as a protest against the dogmatists and medical philosophers of the day, with the express purpose of discarding their theories of the ultimate causes of disease, all of them pure figments of imagination, and all practice based upon such theories, and substituting for these careful observation of the patient and his disease as a foundation for further knowledge. It was not even at that early day intended, nor is it just now, to imply that its followers should discard

all other knowledge, or accept for fact the merest superficialities of observation. It is a perversion of the historical background to identify empiricism with charlatanism and the empiric with the quack. In its proper sense empiricism is the foundation of all the natural sciences and, notwithstanding all of the advances in investigative methods that have in modern times given exact science its greatest glamor, empiricism still holds its necessary place as one of the factors in science. Through a long and tedious course of centuries, observations of medical facts were accumulated by many men in many lands before their correlations and implications could be assembled to constitute an approach to a real medical science; but observations continued and were made the basis of medical practice, however crude, awaiting the advent of the real interpreter, and finally of the investigator and experimental scientist.

Jenner pursued his investigation of the observable facts regarding the protective value of cow-pox over a period of at least twenty-six years before he was prepared to publish his views and put the method of vaccination to a practical test. Laennec was regarded by many of his contemporaries as a useless plodder when he was assembling and classifying voluminous records of cases of pulmonary disease over a period of years before he published to the world his discoveries regarding pulmonary tuberculosis. Darwin was the most assiduous observer and accumulator of facts in natural science before he analyzed them to construct his famous hypotheses. Virchow founded a new school of pathology by extending the scope of observation to cellular processes and comparing and classifying their types. Who will deny to these the title of scientists, because empiricism or observation was the chief basis of their conclusions?

The facts regarding infectious diseases and epidemics, regarding many cardiac and circulatory disorders, regarding diseases of the central nervous system and nutrition, regarding deficiency diseases like scurvy and rickets, and, in short, regarding the whole body of what Sydenham called the "natural history of disease," all these results of empiricism have proved to be foundation stones of more accurate science by newer methods, but are they not in themselves to rank as science? What, after all, is science? Huxley ("The Educational Value of the Natural Sciences") says:

"Science is, I believe, nothing but trained and organized common sense, differing from the latter only as a veteran may differ from a raw recruit, and its methods differ from those of common sense only so far as the guardsman's cut and thrust differ from the manner in which a savage wields his club.

"The man of science in fact simply uses with scrupulous exactness the methods which we all, habitually and at every moment, use carelessly."

Science does not consist in this or that method. It is not necessarily investigative, experimental, or mathematical, nor is the essence of science found, as has sometimes been stated, in the fact that the study in question is not intended for any immediate or even remote practical use; it is rather the product of a certain state of mind.

Neither locality, nor educational opportunity, nor elaborate equipment is an essential of science and the scientist. William Beaumont, an army surgeon at a frontier post, had the mind to conceive and the capacity to carry out physiological investigations that stamped him as a true scientist and made his name, as well as that of his patient, Alexis St. Martin, forever famous. Benjamin Franklin, with little formal schooling, but with a quality of mind rarely equalled and with industry unexcelled, became America's greatest scientist and demonstrated in a hundred ways that the simplest problems of everyday life may be approached in a scientific spirit more profitably than in a thoughtless manner. Wollaston, President of the Royal Society, astounded a distinguished foreign savant who desired to see his laboratory by touching a bell and having his servant bring in the laboratory on a tea-tray.

May we not draw the conclusion that everywhere and in all occupations, with or without extensive facilities, especially in medicine, that owes so much to exact science, it is possible to approach the problems that present themselves in the spirit of science rather than in the manner of empiricism in its cruder sense?

It is easier to define the scientific mind than science itself, for the latter presents as many variations as there are varying domains within the possible scope of human observation; but the scientific mind is always the same. It is that state of mind which, as Huxley expresses it, operates with scrupulous exactness. Facts of whatever nature, accumulated, compared, analyzed, contrasted, and finally assembled by a mind trained to accuracy are the bases of all science. The method by which the facts are obtained, the manner in which their accuracy is assured or confirmed, the processes employed in their verification or in their relation to other known facts, all these are subordinate considerations; the main thing is the state of mind that governs the operations. It is, moreover, noteworthy that imagination is a recognized and often all important factor in science.

"Lastly," said Sir Benj. Brodie (address to the Royal Society, Nov. 30, 1859), "physical investigation more than anything besides, helps to teach us the value of imagination—of that wondrous faculty, which left to ramble uncontrolled, leads us astray into a wilderness of perplexities and errors, a land of mists and shadows; but which properly controlled by experience and reflection, becomes the noblest attribute of man; the source of poetic genius, the instrument of discovery in science, without the aid of which Newton would never have invented fluxions, nor Davy have decomposed earths and alkalies, nor would Columbus have found another continent."

A later and far greater scientist, Lord Kelvin, in another address before the Royal Society, added his testimony to the thesis that many of the greatest discoveries of science owed their inception to the exercise of scientific imagination.

In the consideration of science as related to medicine, we are not especially concerned with the possible ultimate scope of science, for the subject matter of medicine, for the most part, deals with physical states well within the domain of scientific investigation, and is little interested in the wider and largely speculative problems of the origin and nature of life or "vital processes." In general, science makes no pretense of dealing with matters in which it cannot command facts of observation and certain knowledge, neither will it deny anything that lies beyond the scope of such knowledge, except that assumptions in such a field cannot be accepted as within its domain. Those who suspect a special antagonism of science to spiritual things, forget that the attitude of the scientist is exactly the same in the case of physical matters, where there are no observed facts of certain knowledge, and no adequate methods of ascertaining such facts. What were once mere conjectures in chemistry, physics, and medicine, have become established facts by reason of newer methods of observation. The "unknowable and unthinkable" are philosophic abstractions acceptable for a given time, but cannot be allowed the sanction of science for all time; but there should be no misunderstanding of the attitude of the scientist who denying the existence of proofs merely withholds assent to propositions lacking positive demonstration. Science in the last analysis must be verifiable knowledge or it is nothing.

The question is frequently asked whether or not medicine is a science; whether it was not so in earlier days but has become so now; or whether, perhaps, it is merely on the way. It is well known that medicine has been classified as an applied science or art, and to a large extent this has been and still is true of medical practice; but to deny to medicine in its broader relations the status of science would be as unreasonable as to deny biology such a rating, because large numbers of practical men gain a livelihood by mounting butterflies, breeding experimental animals, or mounting specimens for examination. In its entirety medicine is the study of physiologic and pathologic processes in man, and taken as a whole constitutes a science notable in its scope and accomplished results. The fact that practitioners of medicine, to a large extent, must employ methods not yet scientifically established, and that they, themselves, may be devoid of scientific minds or training, is no indication that medicine itself is not a science.

Within the memory of many of us, several of the important sciences have advanced so greatly that we find it difficult to identify what is taught today with what we learned in our younger years. In chemistry the number of elements that have been identified, the new methods of analysis and synthesis introduced, the application of electric methods to chemical manipulation, the whole range of discovery of organic compounds, the synthetic production of substances originally derived only from the vegetable or animal world, the bewildering manufacture of coal-tar and aniline derivatives, represent what has been achieved in the marvelous period in which we live. In physics, to name but the practical applications, electric light, the telegraph, telephone, phonograph, wireless, and all the refinements of recording apparatus, photography, electric motor power and transmission, and aeroplanes, illustrate what has been going on. In the biologic sciences, in metallurgy, in astronomy and in practically every science, similar remarkable achievements mark the rapid progress of our day. Even in that oldest and most exact of sciences, mathematics, a comparison of the past with the present is a step from Euclid to quarternions. Has medicine kept equal pace with other sciences? Within our time the entire science of pathology has been put on a new basis, bacteriology was discovered and the actual micro-organismal causes of most of the important infectious diseases identified, the mode of transmission has been established in the case of such important diseases as typhoid fever, tuberculosis, malaria, yellow fever, typhus and the plague, and their eradication in the future assured, the mechanism of natural and artificial immunization against disease has been largely explained, a long list of obscure diseases affecting nutrition and the endocrine glands has been added to familiar medical knowledge, disturbances of circulation and respiration heretofore obscure or mysterious have been made clear,

chemical and physical methods have been introduced into every day practice, enabling the physician of the day to determine functional efficiency of various organs, to measure the progress of disease and the effects of treatment in almost mathematical fashion, and to extend the range of his diagnostic ability far beyond the most fanciful dreams of our immediate predecessors. Even in anatomy, that part of medical science which was thought to have reached its ultimate development, new methods and new points of view have given an impetus that has resulted in discoveries regarding cellular growth and adaptation of structure to function altogether unthought of in former days. Experimental pathology, serology, immunology, roentgenology, these are but a few of the newer sciences modern medicine has achieved.

Is it any wonder then that medical practice, which of necessity makes use of all these aids, has become complicated, difficult, time consuming and expensive?

Chemistry, physics, and medical science have a certain resemblance. Astronomy, geology, biological sciences and mathematics are highly developed sciences, but those who are engaged in them are relatively few and their investigations have little immediate relation to our every day life; on the other hand, in the case of chemistry and physics, the enormous development of arts and industries has made necessary the establishment of great research laboratories utilizing the highest abilities of great numbers of trained men without whom the phenomenal development of this industrial age would have been impossible. The cost to industry has been prodigious, but has any far-sighted captain of industry bewailed that fact? In medicine properly conducted every practitioner must be more or less trained in the sciences that have contributed to its advancement and its present status. Without the aid of the chemical, physical, bacteriological and other scientific methods by which we assemble the data on which diagnosis and treatment are based, medical practice today would be a mere pretense. As in the case of industry, this implies high costs not only in the performance of the necessary operations, but in the training of those who carry them out. We may long for the simpler methods of diagnosis and practice of other days; we may decry the specialism that has been forced upon us by the growth of knowledge and the multiplication of intricate methods, all of which no single man can master; we may declaim against the growing costs of all the newer advances, but whatever answer the future may find it will not be in the direction of a return to older methods and a denial of the scientific accomplishments that have been achieved.

One hears on every side, even from some who are leaders in the profession and have in their own institutions surrounded themselves with the most extensive refinements of scientific equipment, critical comments on the prolonged and expensive character of medical education. Are such criticisms sound? We should all wish to see our medical students, especially our own sons, qualified to enter upon medical practice at an earlier age and after a shorter period of study than is customary now; we should all like to feel that a body of medical practitioners could be graduated after less prolonged study and yet be able to carry on acceptably the bulk of average medical practice; but can our wishes be fulfilled with safety to the future of medicine and to the public? The evolution of professions, like evolution of all kinds, admits of no backward steps. The pioneers who contributed to the cause of medicine at Transylvania observed and studied disease as Hunter and Jenner and Cullen and Rush had taught them, and not according to the teachings of Galen and Avicenna. In these days the medical man must utilize the methods of chemistry, of bacteriology, or roentgenology, or serology, and so on, to accomplish his proper study of disease. The instrumentalities he is able to employ have become more numerous and complex, but after assembling his data he must still employ the same type of mental operations in their proper evaluation as the physician of earlier days applied to his simpler observations. He must be more widely trained in scientific methods, but no less widely in the use of wisdom and reflection. Unfortunately, often in these modern days a cultivation of scientific methods even in a narrow field is allowed to dominate men's activities, almost to the exclution of general knowledge and capacity for logical analysis. They may be surrounded by a wealth of opportunity and by an elaboration of equipment which they have learned to employ, but they may merely assemble observations without the guidance of the exact thinking characteristic of the scientific mind. Such men may be useful technicians, but are really devoid of scientific spirit.

A curtailment of medical study and a denial to the average practitioner of full training in the real science of medicine, however greatly desired on economic grounds, would inevitably lower the standards and the status of the whole profession. Even though the number of quali-

fied medical men should grow less and though cults of unqualified practitioners should flourish, as they have always done from the earliest days of medicine, the interests of mankind require that those who represent our profession shall be fully qualified by the best scientific training. Medical study will remain prolonged and costly, but the recompense, materially and in standing, will justify the expenditure. So far as the public is concerned, ways will undoubtedly develop which will make the costs less onerous. What we now achieve by laborious and difficult, as well as tedious and expensive methods, will in time become easy of accomplishment. All scientific advances at first are complicated, but later are simplified by short cuts that overcome the difficulties. In medicine we find ourselves in a transition stage in which the multitude of recent acquisitions is largely responsible for confusion and extravagance. So many new discoveries have made available so many new methods, that only the broadly trained are capable of selecting in given cases that which may be useful and neglecting that which is unnecessary. The bewildering multiplication of laboratory methods has especially contributed to the growing costs of medical service, particularly because many of those who are engaged in practice have had little training in these methods and resort to them indiscriminately, and because the public expects or demands investigations frequently quite unnecessary. The corrective for this species of extravagance is the thorough preliminary and scientific training of the physician and a well-grounded knowledge on his part of what is essential in the investigation and treatment of disease. Machine-made diagnosis proceeding from a multitude of laboratory studies before a careful survey of the history and physical condition of the patient has been adequately made, is one of the deserved reproaches of contemporary medicine and one of the principal causes of the increasing costs of medical service. Those who have learned the natural history of disease, who have been trained to study the patient carefully by the methods of physical examination, and who at the same time know in the fullest way the methods and significance of laboratory investigation, will expose their patients to fewer useless studies, and will spare them a great part of unnecessary expense. The most skillful surgeon it was ever my privilege to see at the operating table, a pioneer of abdominal surgery, was accustomed to perform his operations with but a handful of instruments at his side. Compared to his equipment the multitudinous trays of instruments of inferior men always impressed me as highly significant.

Empiricism is observation, whether it be of the primitive type of our early physicians, or that which is derived from the more modern and refined methods of today; but science is the right use of the data of observation by a mind trained to compare, contrast, analyze and conclude. The medical man must be today, as always, an observer first, he must know how to ascertain facts, he must know the nature of disease as recorded experience has made it known, he must know men and their reactions to disease or to unfavorable influences of all kinds, and finally, he must by education and training have the capacity of weighing evidence and reaching conclusions that are exact and not merely approximately exact. If he can accomplish this, he is, indeed, a scientist.

Let not those who are meditating the question of medical education deceive themselves by the thought that it is desirable to lessen the scientific training of their students in favor of what they picture as a shorter and more practical curriculum. No one who has studied the progress of medicine during recent years will deny that in consequence of the phenomenal growth of laboratory methods and the multiplication of instruments of precision, clinical observation has often been crowded to the wall, and a good deal of pseudo-science has grown up where facilities have taken the place of brains; but such conditions are temporary and not widespread. The important matter is that all of our medical students should be so grounded in fundamental sciences by thorough trainlng that throughout life they will bring to bear upon the everyday problems of medical practice the thoughtful attitude of the scientist.

Physicians cannot all be professional scientists, but it is through the observations of practical clinicians that we shall receive in the future, as we have received in the past, intimations and leads that better equipped scientists will make the basis of wider knowledge in many of the still obscure problems regarding human disease. There must be a close cooperation between the practical clinician, who has the daily responsibility of treating the patient, and the more highly trained and equipped scientist to whom we look for ultimate solution of difficult problems. Together, these two types constitute the medical profession, and between them there should be not only cooperation but mutual respect, and they must think in like forms and employ the same vocabulary.

THE PATHOGENIC MECHANISM OF ECZEMA*

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What I shall read tonight was revolutionary even in its tentative form fifteen years ago when it was submitted to the New York Dermatological Society as a thesis. It attacked the roots of the venerable belief that eczema was an enigma. Nay, more, eczema was sacred. The word itself durst not be uttered save by the gray-haired, and then without challenge, reverently in shadowed cloisters. To dare bring it into the light was anathema. Today my hair is turning, and perhaps much that has befallen me may be because I ventured in youth to regard with unhallowed eyes what was sanctified. But I have lived to see this erstwhile irreverence become the basis of an accepted creed. Indeed, one of America's dermatological Nestors, now even greyer than he was then, and then an adversary of my beliefs, recently warmed my heart by stating publicly that he had lived and learned. He is no man to choose as an easy proselyte. There remain those, however, who still hold the modern attitude toward eczema as revolutionary. Yet it is without fear one may bring such doctrine to the intellectual South. The great-grandsons of heretics like Jefferson, Washington, and "Light Horse Harry" Lee do not shrink from ideas that have their birth in reason. Chance words from my beloved teacher, the late James C. Johnston, of Louisville, in the days I refer to turned into their present channels those thoughts of mine which I shall now outline. These very thoughts, therefore, are Southern, and I esteem it a privilege to be elected the vehicle to bring them back to you, albeit in a newer shape, and one I hope would have been acceptable to Johnston were he still here.

If there were dermatologists among the Dawn men undoubtedly some of them averred that eczema was due to the advancing ice cap, and some that it was connected with a glacial tempo too deliberate and unsteady. Others probably suspected malign nocturnal spirits, and still others sylvan demons, particularly if the victims failed to note contact with rhus growing up the trees. The human mind shuts out what is near-by and seeks the remote. It did then. It does today. It is this mental trait that spares God's mundane kinship and perhaps explains the Divine ire at Eve's challenge when she nibbled the forbidden fruit. What eczema is, is clear enough to those who care to see it. Details will be added, with enriched experience, but how the picture will finally look is already apparent.

A review of the history of eczema will disclose pages studded with hypotheses reflecting the general attitude of medicine toward disease at given periods. The derivation of the word itself shows it was originally meant to describe a state of boiling or bubbling over. Undoubtedly the vesicles suggested this image, which, of course, implied an inner urge provoking the ebullition. This concept established a bias still effective. Thus it is not astonishing that the French considered it dartrous, the English gouty, the Germans exudative, when such beliefs in diatheses were in vogue. These schools have not yet entirely discarded tradition. Moreover, at various times, emphasis has been laid on dentition, infancy, adolescence, the climacteric, senility, metabolic and endocrine disturbances as causes of the syndrome. To complicate matters a rich descriptive dialect developed which named each trifling aspect of the eruption, further qualified by names for its varying sites, stages, and the life periods in which it occurred. Redundance like this may be amusing in retrospect, but many writers still adhere to it and increase confusion by introducing focal infection and psychogenic influences into the question, while others attempting generalization and inept jest fall afoul of nonsense, as a recent author did in a contribution purporting to show eczema to be dyspepsia of the skin.

None of the viewpoints enumerated is much less far-fetched than the hypothetic hypotheses of the Dawn man, even though most of them were sincere efforts to build with available bricks. Few people can reason ahead of their era, and they usually die before their ideas are accepted. It is hard, though, to be lenient with those who lag or with those who, like the dyspepsia author, erect straw men to slay them. Precisely as the Dawn man ignored the poisonous plant later dermatologists ignored what stared them in the face, namely that, irrespective of all obscure forces or agents, something had to touch the skin that the skin could not tolerate if eczema was to be developed.

For a moment reflect on the condition called dermatitis venenata, of which ivy poisoning is an example. This is an acute catarrh in which the skin turns red, is covered with single or grouped blisters of different sizes, that either dry, or burst and discharge serum, forming crusts. Final-

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ly scaling takes place, and in a week or so the eruption has run its course. During the early stages there is itching or burning. Acute eczema looks and acts exactly like this. Now suppose, not yet having learned that poison ivy is toxic, a person is frequently re-exposed to it. He will have recurrent or chronic dermatitis venenata. Moreover, he will be well in winter and affected mainly in spring, summer and the early fall. How easy it would be to ascribe the disease to hot weather! Expecting this affection every year, let us imagine that one May he gets typhoid fever followed by femoral phlebitis, causing confinement to the house for several months. He will not have his skin disease that year. How easy to infer that serious systemic diseases prevent eczema; that the internal cause usually operative has been suspended by a severe illness! Next suppose that a year later the patient goes to Europe. Again he will be free of his eruption. He adds to his misinformation the belief that sea trips affect him favorably. The following summer he is at home. Table decorations are sought for a dinner. His wife and children collect leaves he helps to arrange. A few hours later his hands begin to burn, and he recognizes the return of his old affliction. His relatives remain well. He recalls the leaves as a common weed growing in the vicinity. He wonders if these could have provoked the recurrence. Once again he goes out and plucks some of the vine. Dermatitis sets in. A great light dawns. He has successfully performed a first rate piece of research. He has, in a word, learned everything important known about eczema.

He has discovered that a malady ascribed by tenuous theories to a curious seasonal or geographical influence had nothing to do with either; that a severe intercurrent disease which seemed to prevent his usual eruption was not responsible for this apparent immunity. He has found out that a certain plant caused it, but that it did not harm his wife and children. He has found out that the reason he was affected in summer was that the offending plant grew in summer, and that the reason he was well while abroad was that this plant did not grow in Europe. Above all he has learned that he is different from the other members of his family, since he exhibited the dermatitis and they did not. He has verified this by a test. If he told friends about his experience he probably said, "Isn't it queer? I get a rash from a plant that grows near my home, but the wife and kiddies don't." If he had the misfortune to be a physician he might have added with the pedantry of our kind, "I have an idiosyncrasy to (having looked up his botany) *rhus toxicodendron.*" He might have done worse and queried if it were allergic or just toxic, or an example of atopy or what not. The simple fact was that poison ivy injured him and not the rest of his household. As to rhus he was a peculiar and particular individual. When he told his story about, he discovered a number of people to dot his "i." Thus he learned that he belonged to a group subject to a disease which a common weed provokes in some people.

As long as thirty years ago a few dermatologists began to whisper the heresy that dermatitis venenata and eczema were identical. Immediately the reactionaries became raucous and divided into two groups, one maintaining that the two conditions were entirely different, the other that eczema was like dermatitis venenata, but due to internal or metabolic disturbances, while dermatitis venenata itself was due to a demonstrable external agent. Today the majority of dermatologists subscribe to the doctrine that eczema and dermatitis venenata are one. The minority, however, are still articulate, Darier of Paris being their chieftain. There are also a few people left who deny that the earth is a sphere.

Some twenty years ago Sir Norman Walker reported on a patient suffering with chronic recurrent eczema for which she consulted numerous dermatologists at home and abroad. While away from her home her physicians treated her successfully. When she returned her affection always did likewise. A bit of detective work on Sir Norman's part disclosed the primrose among her home decorations. When this plant was banished from her environment the patient lost her eruption at once and forever. The primrose is to Europe what rhus is to America. How closely Walker's case corresponds with my imaginary one outlined in the paragraph before last! That primrose causes dermatitis venenata is an old story. To gain acceptance of the obvious, however, remains difficult. Yet no eczema case is inherently more complex than this. The solution is only to find the primrose or its understudy, not always easy to accomplish.

Fifteen years ago I defined eczema as a cutaneous catarrh due to an interplay between various known and unknown, local and predisposing causes to which the skin lesions are reactions. This was stating succinctly what other Americans, Pusey, Fordyce, Johnston, had already suggested as their opinion. My views had been shaped by the eloquence of Sir Norman Walker

and the late James C. Johnston. On the Continent, Jadassohn, Riecke and Kreibich had similarly expressed themselves. In an ill-starred moment I suggested also abandoning the word eczema and adopting the term dermatitis for the group in question. Subsequent debate revolved about the inessentials of the designation. I herewith go on record as asserting that it is of no consequence what a disease is called if what it signifies as a biologic process is clear, and it is clear today that what is termed eczema and what is termed dermatitis venenata are one and the same. It is nomenclature and not evidence that has perpetuated an unjustified duality. Seven years or so ago I published clinical experimental evidence further substantiating my point of view, and at about the same time Bruno Bloch published similar observations in hundreds of cases where mine were numbered only in dozens. Neither of us knew of the other's work, but his studies were better conceived than mine and were more convincing to Americans partly for this reason, and partly because they had the aura of being imported. The point of both studies was their compelling proof that eczema and dermatitis venenata were produced in the same way. The conviction lay in cutaneous tests supported by clinical observation.

About thirty years ago Jadassohn predicted that eczema could be artificially produced by a local or patch-like application of substances capable of provoking eczema to a skin capable of developing eczema, precisely as dermatitis venenata is produced in nature. This was the earliest reference to a method of study now famous as the patch test. In this country, about ten years ago, Markley of Denver first successfully employed the idea in a patient suspected of getting eczema from guinea pig hair. Percutaneous and intracutaneous tests had indeed been made in eczema, but the lesion they produced is usually a wheal, while the positive patch test causes redness, swelling and vesiculation, in short a miniature of eczema or dermatitis venenata. It was because he perfected the technic of the patch test that Bloch's work has become classic.

Bloch ascribed the phenomena to allergy. I assigned no name to them; moreover I did not use the patch test as skillfully or consistently as Bloch. In any event, with reference to his work, as well as with reference to my own intellectual cravings, the vital things were that eczema could be produced artificially and that this discovery could be utilized to disclose the provoking agents in given cases. Bloch further demonstrated that some people were susceptible to only one such agent, others to two or more. He called the first type monovalent, the second, polyvalent, eczematics. Note the word eczematic. Besnier, a French dermatologist in his prime a generation and a half ago, had crystallized from experience the aphorism, "There is no eczema, there are only eczematics."

What Besnier meant was that the capacity to develop eczema indicated an individual peculiarity, to the biologically minded more interesting than the clinical manifestations of the disease. He was trying, as all excellent medical thinkers try, to envisage diseases as processes, not as entities to be docketed. From the times of Hippocrates, Aristotle, Galen and Avicenna until today, medical progress has relied on mentality functioning like Besnier's, Jadassohn's and Bloch's. Bloch's resourcefulness and Jadassohn's inspiration gave substance to Besnier's prevision. Among them they isolated two principles, that of the eczematic and that of the eczematogen, as Bloch calls it, interoperating. If I may say so, at the risk of immodesty, this is not very different from my own belief that eczema is due to an interplay between various known and unknown local and predisposing causes to which the skin lesions are reactions. In fact, in a recent paper Bloch revised his older views so that, save for our difference in expressing them, we are obviously in complete accord. His last definition reads as follows:

"Eczema represents an idiosyncratic reaction of the skin against manifold irritants (substances) almost all of which are alien in nature to the body, and which (in general) come in contact with the skin exogenously, or (more rarely) via endogenous (hematogenous) channels. Thus to produce eczema two requirements must be filled, the idiosyncratic receptivity (specifically monovalent or polyvalent) of the skin, and the presence on the skin of the provoking substance (the idiosyncratogen)."

Note that today Bloch no longer confines his beliefs to allergy, but has expanded them to the concept of idiosyncrasy, using the term idiosyncratogen for the excitant. I prefer the words eczematogen and eczematic, employed without prejudice as to the nature of the underlying mechanism, for to me they seem more philosophic precisely because no bias whatever inheres in them. They describe specifically the two factors necessary to produce the disease from whose name these terms are derived. Thus the views of Besnier, Jadassohn, Bloch and myself cement those of all of the authors hitherto mentioned in this essay, and constitute the modern conception of eczema.

The essence of this concept is that the key to the pathogenesis of eczema is the mechanism

causing dermatitis venenata, namely an eczema-evoking substance affecting an eczema-responsive skin. Hence it logically follows that eczema and dermatitis venenata are the same thing. The last statement requires no elaboration. It is important, however, to know what is meant by an eczema-evoking substance and an eczema-responsive skin. First a few generalizations! Eczema-evoking substances are called eczematogens; eczema-responsive skin is called eczematic skin. The eczematogen is characterized by having a pathogenic potential, the eczematic skin by having a responsive potential, the two potentials actively manifesting themselves when the agent comes in contact with the skin. Thus what these agents are can be recognized, and how they may be classified can be determined, only with the skin as an indicator. Likewise who has eczematic skin, namely, who are eczematics, can be determined only by means of eczematogens as indicators.

An eczematogen may be defined as a substance that evokes eczema in an eczematic. Any substance, whatever its chemical or physical nature or derivation, may act as an eczematogen, whether it comes from the outer world, is indigenous to the skin, or arrives there from within the body. From external sources contacts may be made with animal, vegetable, inorganic or organic chemical substances. Thus soaps, cosmetics, drugs, cleaning powders, cleaning fluids, exterminators, plants, vegetables, pigments, dyes, oils, in fact anything in the home, garden, field, woodland, factory, studio, club, shop or laboratory used in any activity or pursuit, may be offenders. It is obvious that mode of life, habits, occupation or mere chance are the media conditioning exposure. Indigenous to the skin are parasites, notably certain fungi, themselves or substances they manufacture, which may be eczematogens. From within the body products of metabolism, whether disturbed or normal, and ingested matter may function as pathogens. The question is not whether one or several substances can act as eczematogens, but whether they do. The answer inheres in whether or not it can be demonstrated that they do by tests with the suspected substances in eczematics. More of these tests later, after the term eczematic has been defined!

An eczematic is an individual whose skin develops eczema when it is exposed to an eczematogen. This means nothing more than that he is predisposed, that he has an idiosyncrasy, that his skin behaves as most skins do not. The intangibles of predisposition are subtle enough to warrant discussion separately from the more tangible considerations. The latter will be dealt with first, although they are by no means completely understood either. Yet a presumptive classification of them may be tendered under the headings of cutaneous and general states or disturbances. Cutaneous factors include variation in the skin at different sites, anatomical or functional, such as increased heat and moisture in the body folds; skin abnormalities in themselves not eczema, as seborrhea, ichthyosis, pruritic dermatoses provoking scratching; the effect on the skin of any sort of local treatment, physical or chemical, for non-eczematous disturbances, as Roentgen rays, keratolytics, antipruritics. At this point, for it is just the same sort of thing, exposure to physical or chemical agents through occupation, or as the result of habit, locality or mode of living might be referred to. Manifold influences here come into play for greater or shorter periods which definitely can be shown to alter the response of the skin to eczematogens. A man who for years himself had cleared his place several times during the warmer seasons of the rhus vine, without being affected, finally did get a most severe attack. Either the man's skin must have changed or the rhus must have. Or a patient with alleged tinea of the feet and groin received Roentgen treatment for it, whereupon it was disseminated, but until the Roentgen therapy was stopped he did not improve. This case will be mentioned again in connection with general states or disturbances. These are conceivably any metabolic, ductless gland, central or sympathetic nervous disfunction or imbalance, operating directly upon the skin, or indirectly, through first disturbing the function of any organs within the body. Even psychogenetic influences might be included.There can be no doubt that abnormal substances elaborated within the body, on reaching the skin might raise its responsiveness to eczematogens, while in some instances they may themselves be endogenous eczematogens. The same is true of ingested matter, as in Bloch's patients, with formalin or quinine eczema, in whom attacks could be induced when urotropine or quinine was taken by mouth. My own patient referred to above whose eruption was disseminated by the x-ray subsequently had a recurring generalized eczema. This was when I saw him. It certainly was not tinea then. In the course of a series of chemical studies, which were negative, and clinical examinations, it was found he had a renal stone. The affected kidney was removed, a shell of tissue containing an antler calculus bathed in pus. Within three days his eczema

disappeared and he has been rid of it for nearly three years.

This experience is particularly illuminating. A man in his mid-thirties had alleged dermatophytosis. The parasites were not looked for. The *faut de mieux* method of treatment, the Roentgen ray, was applied. The eruption generalized. There was increased susceptibility! By the grace of God and emollients the patient recovered in six or eight months. A few months later the eruption reappeared (this time without previous Roentgen therapy), and permanently vanished after a pus sac was removed from the place formerly occupied by a kidney. Clearly the x-rays provoked dissemination of a localized type of eczema. The susceptibility once having been raised in this manner, a recurrence took the generalized form. The role of the diseased kidney was either that of making the man an eczematic, responsive to external eczematogens, or of actually furnishing an endogenous eczematogen to an eczematic. Either way the diseased kidney was at the bottom of it all, for after the nephrectomy he got well. This is no plea for nephrectomies in eczema. The point is that internal disturbances can bring about predisposition to eczema or supply an eczematogen.

The intangibles of predisposition cannot be so concretely discussed. There is no doubt that often eczema reflects an antigenantibody reaction, that it is indeed allergic, as Bloch's success in sensitizing to primrose shows. But not everything is necessarily this. A broader concept, that of atopy, may be the proper one. For myself, I can think of a still broader concept. I did, fifteen years ago and I adhere to it today. It requires no name. It is the observation that eczema results from the interplay between known and unknown external and internal factors. The fact today can be demonstrated in part by means of local tests, by the intracutaneous, the percutaneous and the application methods.

A positive reaction by the first two methods is indicated by a wheal surrounded by more or less erythema; by the third, the so-called patch test, by a small area of erythema, redness and usually vesiculation. It produces eczema in an area corresponding to that of the patch. Occasionally this effect is produced by the other two procedures. The patch test, which is merely the application of a suspected eczematogen to an eczematic or uninjured skin, is the one which most closely reflects the condition under which eczema is produced. A negative result may not preclude the eczematogenous character of the suspected substance, but a positive one is strong evidence thereof. In practice this knowledge fosters the determination of what to exclude from contact with the susceptible. By so simple a procedure a given case may be explained and cured.

It rests with the laboratory to decide whether idiosyncrasy is always allergic, or whether it indicates atopy or ordinary hypersusceptibility. What of it to the practitioner? Recently it has become the vogue to speak of eczema as "allergic dermatitis." What is allergy except one mechanism by which poisons are affixed to cells in such a way as to injure them? It is only on explanation of why one man's meat is another man's poison. Atopy is another explanation, and probably there are still more undiscovered explanations, every one of which will be christened at its birth, and physicians, like grandparents, will continue to rave about each new baby and name diseases for it. That is all there is to be said for the term "allergic dermatitis." Allergy is a biologic, not a clinical concept. Broadly speaking, all disease is due to peculiar responsiveness of tissue to given excitants. Eczema is not singled out for this distinction. The character of this cutaneous predisposition to the disease may be allergic, atopic or something else. These qualities may be inborn or develop with time. If they are inborn they may be hereditary, or if acquired, due to an inherited tendency, or to other diseases or traumata to the skin, or to internal disturbances. Such matters, and it rests with medical biologists to deal with them and clear up the problems they involve, are of first rate scientific importance. To know eczema thoroughly, it is, of course, as important to understand predisposition as to understand precipitants. To know how to prevent or cure the disease it is as important to understand predisposition as to understand precipitants. Today we are almost completely in the dark concerning this important aspect of the problem. But we have considerable knowledge of one equally important, and that knowledge can be used in practice to find out from what contacts to protect an eczematic subject.

Let the allergists and atopists fight out in the arena of the laboratory what predisposition is. The patient concerns himself only with how this predisposition may be kept from troubling him in the form of eczema. Any physician willing to forget gout, uric acid, hyperglycemia and the like for a little while can help such a patient. Any physician can rise above the Dawn men, can ignore the forest imps, the advancing glacier, and see the poison ivy. It requires only horse

sense to ask a patient about his habits, work and diversions, and on the basis of this questioning, to think out what substances would be the ones likely to cause the eruption for which the patient seeks help. To apply a little of these substances to the skin over the scapulae, to cover each test area with a little gauze, oil silk and adhesive tape, to leave this on for twenty-four hours, and then to see under which patches the skin has remained normal, or turned red, or blistered, requires something less than the black art. Having isolated the offenders, to tell the patient to keep away from them is the answer to the cause and treatment of the disease. To do all this is to put in practice all we know today about eczema. One might never have heard of allergy and still be qualified to achieve these ends.

To find out in this simple way that Mrs. So-and-So gets her eruption from a fly spray, or a patent cleansing fluid, or plain gasoline; or that her husband gets it from the resin on his violin bow; or the daughter from a resorcin lotion some physician gave her for enlarged pores, or that the cook gets it from one of the lye cleansers, are cases in point. Literally hundreds of examples might be added. But it is not fair to assume that a woman with eczema of the neck gets it from a fur, or a surgeon with eczema on his hands has gotten it from antiseptics without proving the point. The lady might have been using a new lotion on hereslf; the surgeon may be susceptible to printers' ink on newspapers. Formerly the etiology perforce was speculative. Now it is demonstrable. Is there any essential difference between any of this and ivy poisoning? Even athlete's foot, tinea of the feet, with far-flung phytemic lesions, is in this category save that the susceptibility exists toward a living parasite, or its elaborated toxins, and not toward lifeless poisons. In fact, the toxins of such a parasite may be to the parasite what toxicodentric acid is to the rhus plant, or primulin to the primrose. Otherwise there is no difference.

Biological questions in great number still remain unanswered in connection with eczema. The explanation of eczema with its resultant elucidation as to the cause and relief in given cases, is no longer elusive, but is already simple enough to be taken over in practice as an applied art. To diet a person with eczema, to ponder over uric acid, sugar and cholesterin coefficients in his blood, to essay overcoming his predisposition in such ways, are gratuitous unless the attempt to discover the precipitants has failed. At this point, however, may a word of caution be uttered? The ancient and honorable custom of climbing on the band wagon has never been ignored by physicians, and when they do they shout too loud. The echoes of focal infection still resound. The patch test is not eczema. It is a method, good but not flawless, of finding out, by no means invariably, what provokes given cases. At times it is negative when it should not be, such is the perversity of all tests. At times a substance so incriminated is guiltless as a maiden's heart. It should not form the rallying point of a cult any more than allergy should. Doubtless a still more reliable successor will one day be found. In the meantime it is excellent for our purposes, because it reflects rational and logical thought in its discoverers, and because in the main it works. That is saying a great deal for it, but it is not all there is to know about eczema. It has put the Dawn men in our midst on the defensive. Some are fleeing on the poor little eohippus, but a few still stand their ground, refusing to see the rhus now frankly burgeoning as the ice cap recedes.

853 Seventh Avenue.

THE CLINICAL VALUE OF SCHILLING'S DIFFERENTIAL BLOOD COUNT IN PYOGENIC INFECTIONS*

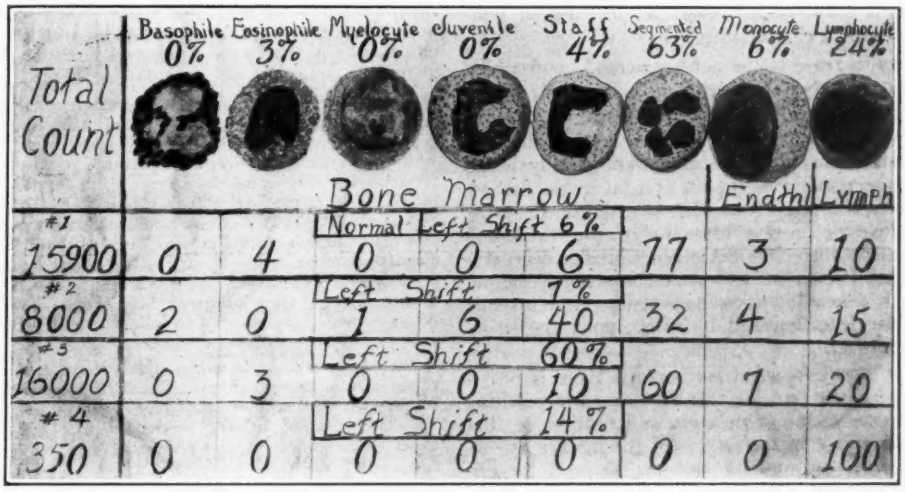
By JOHN D. ALLEN, M.D.,
Louisville, Ky.

The object of this brief discussion will be to present in a practical way to the clinician a few points which have been found serviceable in the interpretation of Schilling's differential count in pyogenic infections.

The technical phase of the subject will not be discussed. The practical phase will be presented by briefly reviewing Schilling's classification of white blood cells and briefly analyzing a few cases selected from the laboratory files of one of the hospitals here in the city, where I happen to be consulting pathologist.

Schilling, as you perhaps know, recognizes only three classes of white blood cells, namely: the granulocytes derived from the bone marrow, the monocytes derived from the reticulo-endothelium and the lymphocytes derived from the lymphatic system. As lymphocytes, he recognizes only the small lymphocytes. The large mononuclears and transitionals are classed as monocytes and under the heading of granulocytes he has

*Clinic, General Clinical Session, Southern Medical Association, Twenty-Fourth Annual Meeting, Louisville, Kentucky, November 11-14, 1930.



Schilling's Hemogram With Chart

added three cells in the place of our polymorphonuclear, namely: the juvenile, the staff and the segmented. Taking the undisputed position that the juvenile and staff are young neutrophils he has devised a classification which gives us an insight into the part played by the bone marrow in pyogenic infections not possible to obtain with our conventional classification; for toxins, especially bacterial in origin, either stimulate or depress the bone marrow, resulting in a relative increase or decrease in cells of the younger type found in the peripheral circulation, thus giving us a relative idea of the severity of an infection.

In acute infections the bone marrow responds first, then the monocytes, then the lymphocytes: so that in acute pyogenic infections we expect an increase in the granulocytes; in subacute, an increase in monocytes, and in chronic infections an increase in lymphocytes.

The above schematic arrangement of white cells is Schilling's hemogram. The first cell pictured is the basophil. This cell normally does not occur in the peripheral circulation (at most in the proportion of 0.5 per cent), and when found indicates a loss of resistance on the part of the patient, or means that the defensive forces are being broken down. Next is the eosinophil. This cell normally is found in the peripheral circulation in the proportion of 3 to 4 per cent. The eosinophil is the most sensitive of all the white blood cells and is the first to disappear in acute infections, and the first to return as recovery takes place. Therefore, the absence of eosinophils in the differential count is unfavorable and their presence a favorable finding.

The third cell is the myelocyte. This is the parent bone marrow cell and normally is not found in the peripheral circulation. Its presence indicates extreme bone marrow irritation or toxemia, therefore, it is a most unfavorable finding in a differential count.

Next, is the juvenile, developed from the myelocyte, also a young bone marrow cell, which normally is not found in the peripheral circulation. Its presence indicates extreme bone marrow toxemia, or irritation. Consequently it is an unfavorable finding.

The fifth, or staff cell, is a stage in the development between the juvenile and segmented, therefore, a young bone marrow cell found normally in the peripheral circulation in the proportion of 4 per cent, an increase above this indicating bone marrow irritation. The mature bone marrow cell, the segmented, is normally found in the peripheral circulation in the proportion of 63 per cent. An increase is noted in pyogenic infections or any bone marrow stimulation.

The last two cells pictured, the monocyte and lymphocyte, are derived from the endothelium and lymphatic systems, respectively, and are normally found in the proportion of 6 and 24 per cent in the peripheral circulation. Both cells have a tendency to disappear in acute pyogenic infections and return as infection is being overcome. An increase in monocytes indicates as a

rule a subacute infection; an increase in lymphocytes, a chronic infection.

An increase in the non-segmented neutrophilic cells, namely: the staffs, juveniles and myelocytes causes a left shift in the gram; an increase in the segmented a right shift. A left shift indicates bone marrow stimulation, usually found in infections; a right shift is a favorable finding. The percentage of the shift is determined by the relative proportion of non-segmented and segmented neutrophils. A regenerative or degenerative shift is indicated by the character of the nucleus, depending upon the severity of the toxemia of the infection and its effect upon the undeveloped cell.

In a physiological leucocytosis there is no effort on the part of the bone marrow resulting from an undue stimulation or irritation, so that the increase in the cells is of the mature or segmented type, and the leucocytosis is of the liberation type. A mild pyogenic infection on the other hand results in a mild irritation of the bone marrow, producing a mild or moderate effort on the part of the bone marrow which is followed by a moderate outpouring of cells of the younger type, resulting in a left nuclear shift of from 15 to 20 per cent. A severe pyogenic infection similarly results in a left shift of from 20 to 40 per cent. A very severe pyogenic infection likewise results in a shift of from 40 to 60 per cent. Beyond 60 per cent as a rule, there is beginning bone marrow inhibition or paralysis resulting in a leucopenia; so that a leucopenia in a known pyogenic infection is a most unfavorable finding.

CASE

With these thoughts in mind we shall briefly review the findings in the differential counts in the cases charted above.

Case 1—This patient was brought into the hospital with a tentative diagnosis of acute appendicitis or stone in the right ureter. An analysis of the blood count pictured on the chart reveals the following. The total count is 15,900, a moderate leucocytosis, suggesting infection. There are no basophils (a favorable sign, showing that resistance has not been overcome). There are 4 per cent eosinophils, which is favorable. (Eosinophils disappear in severe acute infection.) The absence of myelocytes is favorable. (There is no severe bone marrow irritation.) The absence of juveniles is favorable (no severe bone marrow irritation). Staffs, 6 per cent, are practically within normal limits (slight bone marrow irritation). Segmented forms are 77 per cent (mature neutrophils, liberation leucocytosis). There are 3 per cent monocytes and 10 per cent lymphocytes, making the total of both within normal limits. The left shift as you see is only 7 per cent. The interpretation is that this is not a pyogenic infection.

The patient was given ¼ gr. morphine. The urine showed numerous red blood cells. Blood count made two hours later showed a total of 8,500 cells, with normal differential. A small stone was passed from the right ureter and the patient had no further trouble.

Case 2—This case was brought into the hospital with a surgical diagnosis of acute appendicitis. Routine count by a technician showed only 8,000 leucocytes, which is certainly not suggestive of acute pyogenic infection. The differential, however, presents a different picture. The 2 per cent basophils is indicative of lost resistance. The absence of eosinophils indicates an acute infection. (Eosinophils disappear from the peripheral circulation in acute infections.) The 1 per cent of myelocytes shows extreme bone marrow irritation, indicative of very toxic infection. Six per cent juveniles shows extreme bone marrow irritation and 40 per cent staffs extreme bone marrow irritation.

The 32 per cent of segmented forms shows reduction of the mature bone marrow cells, making a left shift of 60 per cent. Monocytes and lymphocytes are reduced. The interpretation is very severe pyogenic infection, to which the patient has lost resistance.

Operation performed at once revealed a gangrenous appendix, with general peritonitis.

Case 3—This case is not of the spectacular type and is reported because it demonstrates the prognostic value of the differential count.

I was asked personally to do this count, and given the following brief history of the case by the clinician. The case was a baby 18 months of age, who had had double paracentesis two weeks previously, with discharging ears in the meantime. The x-ray diagnosis was double mastoid. The diagnosis of the ear specialist was double mastoid and immediate operation was advised. The parents objected seriously to the operation, so the clinician in the case asked for a blood count. Referring to the charts, the leucocytosis of 16,000 is indicative of moderate infection, which could be accounted for by double otitis media.

Differential.—There were no basophils, showing that the patient had not lost resistance. The 3 per cent of eosinophils is favorable, showing the acuteness of the infection had subsided and the patient is resisting the infection. The absence of myelocytes is favorable, showing that there is no extreme bone marrow toxemia, which might be expected in a double mastoid. There are no juveniles, also favorable, showing that there is no pronounced bone marrow effort or irritation. Ten per cent staffs indicates slight bone marrow irritation. Segmented forms are 60 per cent (mature cells) making a left shift of only 14 per cent. Total monocytes and lymphocytes are both increased, a favorable finding (in severe infections both are reduced).

The patient has a moderate infection with good resistance, with no evidence of an undue amount of absorption as would be expected in double mastoid. The operation was postponed, the ears quit discharging in ten days and the child had no further trouble.

Case 4.—This is a case of agranular cytosis or malignant neutropenia, illustrating complete bone marrow paralysis, resulting from extreme toxic infection. There was a total count of only 250 white cells, with no bone marrow cells. This case was brought to the hospital with temperature of 105°, with a diagnosis of sepsis. This, of course, is a terminal blood picture. The patient died six hours after the blood count was made.

CONCLUSION

Such interpretations are not possible in every case, therefore a blood picture should rarely, if ever, take precedence over an outstanding clinical picture. On the other hand, an outstanding blood picture should not be ignored because of the absence of clinical symptoms. For just as the clinician after careful study, elicitation and compilation of symptoms is able to diagnose and forecast impending danger or improvement, so the hematologist is able in most cases to elicit the corresponding symptoms in the differential blood count.

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THE INFLUENCE OF SODIUM CACODYLATE ON THE LEUCOCYTE COUNT*

By J. K. FANCHER, M.D.,
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The primary purpose of the administration of arsenic is to stimulate the formation of erythrocytes. Especially is this desirable in anemia, tuberculosis and certain chronic skin diseases, as psoriasis. It is doubtful whether many of us have thought of any other possible effect of arsenic upon the blood picture. We have heard that arsenic is supposed to produce a leukopenia, but that seems of little consequence if we can raise the red cell count or bring bloom to the pale anemic. We have learned to disregard the old rules for dosage and give drugs for therapeutic effect. Arsenic is a poison, but we have become accustomed to the use of poisons in healing so that we scarcely give it a thought.

The significance of arsenic in the excretions was tested by Vogel[1] in a series of 100 cases over a period of three years. He found arsenic in 85 per cent of cases suffering from jaundice (in excretions of patients without discoverable cause and without symptoms). Also, arsenic has been detected in the bile 25 minutes after intravenous administration of arsphenamine. In the feces arsenic is eliminated about eight times as much as in urine. The most thorough workers have shown that in most cases arsenic is a normal constituent of the urine, the amount depending upon dietary conditions, or the use of medication, externally or internally.

The three principal arsenical preparations are Fowler's solution, arsphenamine and sodium cacodylate. In the present discussion we shall deal with only one of these, sodium cacodylate. This liberates arsenic slowly into the circulation. There seems to be a tendency at present away from its use. Some of us employ it only as a placebo, to keep the patient under observation. Others give it as a hematonic. Others use it perhaps with a view of the financial remuneration involved. It is acknowledged by most of us that oftentimes the employment of sodium cacodylate does not produce the desired result; in fact, sometimes the patient becomes worse. To discover a possible etiological factor in this disturbance of resistance is the object of this work.

Many drugs are administered intravenously when other routes offer equal efficiency. The chief argument for the intravenous use of sodium cacodylate seems to be the absence of pain on injection, and the rather immediate effect. However, the thrombi resulting from a series of injections intravenously often give great difficulty in time of emergency, such as transfusion, or treatment which of necessity must be intravenous. We see examples of such cases more and more frequently. If intravenous therapy must be employed, an ordinary hypodermic needle should be used. This is of advantage for two reasons: (1) it causes much less trauma to the vein wall; (2) it forces the operator to give the injection slowly.

The question of what constitutes the resistance of a patient to disease, and how it can be measured, is only partly answered today. For many years the white cell count has been the chief signal which we as physicians have followed. However, the opsonic index, agglutination test and fragility tests, are among those which are more and more used. The value of bacteriolysins and basteriophages has been demonstrated, but we have only theories to account for their exact relationship to the white cells. In this experiment we have used the total leucocyte count of the blood only. In other words, we assume the total white cell count of the blood will give us the most information. Differentials were made in a few cases, and since they were within normal limits were discontinued. Medlar[2] showed that the differential count in normal individuals varied only one-third as much as the total white cell count.

In an effort to determine whether one form of administration of sodium cacodylate is superior to another, the following experiment was

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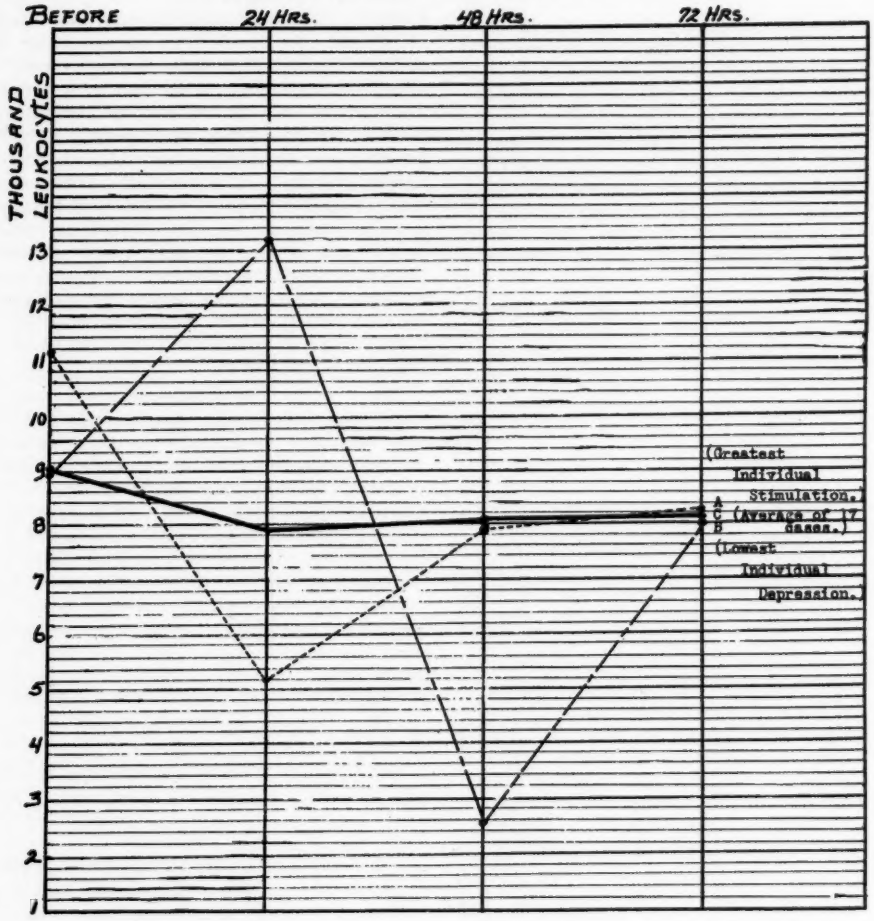
*From the Medical Department of Emory University School of Medicine.

*Received for publication October 16, 1930.

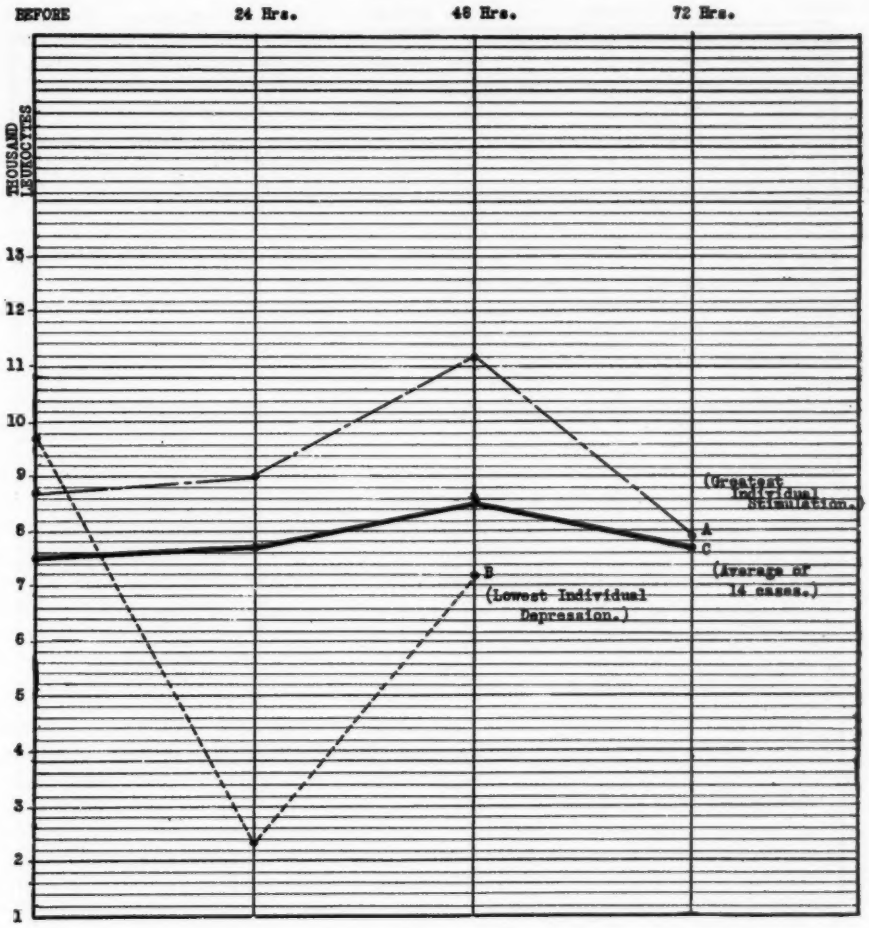
SODIUM CACODYLATE (3 gr.) INTRAVENOUSLY



made: In groups of ten, 60 or more apparently normal individuals were injected, and counts were made immediately before the injections, as well as 24 hours, 48 hours, and in some cases 72 hours after. This was done with the intravenous and subcutaneous methods. The blood was taken at the same time each day by the same person. Each pipette was numbered and used for the same subject throughout the experiment. The subjects used were volunteer medical students of the first and second year classes. All of these were approximately the same age, ate at the same hour at noon and did the same kind of work. The time of taking the blood and making the injections was 2 p. m. on Mondays, Tuesdays, Wednesdays and Thursdays. All experiments began on Monday. The dose of sodium cacodylate was fixed at 3 grains. There were three kinds used: sodium cacodylate (3 gr.) intravenously; sodium cacodylate (3 gr.) subcutaneously; and sodium cacodylate (3 gr.), with 1 per cent butyl alcohol subcutaneously.

The graphs which follow explain the results. It will be seen that not all 60 experiments were

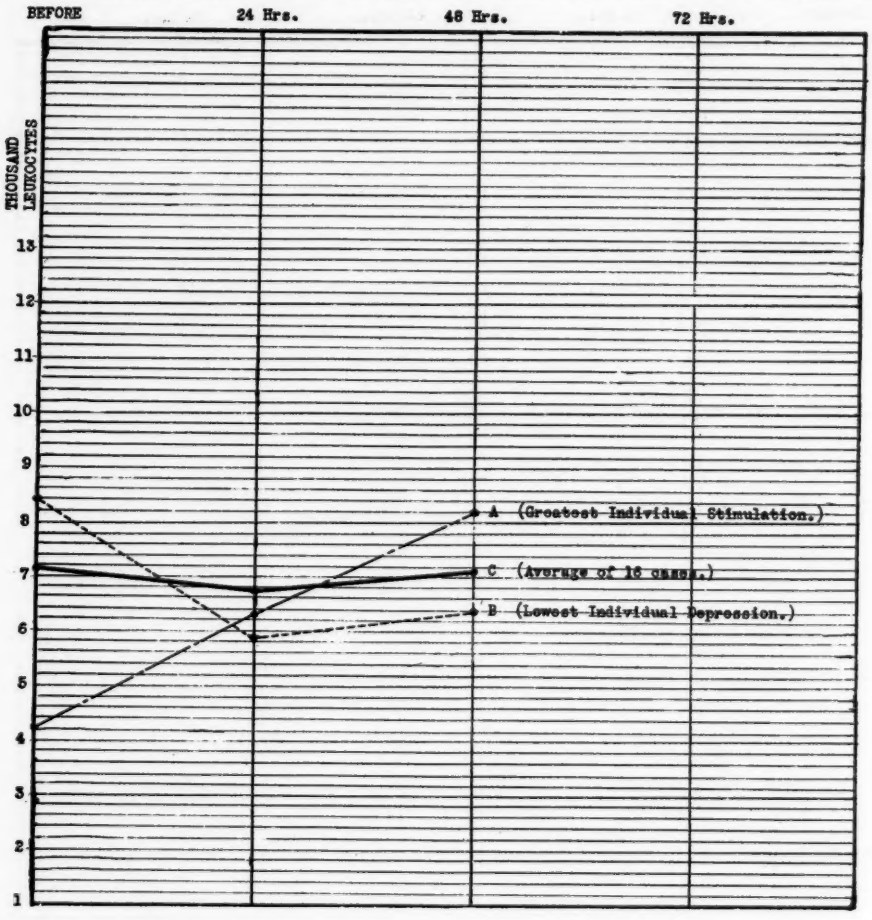
SODIUM CACODYLATE (3 gr.) SUBCUTANEOUSLY



reported. This is because of some unavoidable accidents which interfered with taking or counting the blood in certain cases. Only fully complete tests are recorded. Sodium cacodylate intravenously produced a lowering of the leucocyte count in seventeen cases, averaging 1,000 cells depression, which did not return to normal in 72 hours. The highest individual rise occurred in 24 hours, in one case from 9,000 to 13,000 cells, but in 48 hours this fell to 2,350 cells. The lowest individual decrease was in 24 hours, from 11,000 cells to 8,200 cells.

Sodium cacodylate subcutaneously in an average of 14 cases, showed a slight rise at the 48 hour period, being slightly higher at 72 hours than at the start of the test. The lowest drop was from 9,750 cells to 2,350 cells, in 24 hours. (This patient developed a coryza at this time for the first time in over 2 years.) Sodium cacodylate, with butyl alcohol as a local anesthetic, showed practically no change in the leucocyte count in an average of 16 cases. The lowest drop was from 8,350 cells to 5,800 cells in 24 hours. The highest rise was from 4,200

SODIUM CACODYLATE (3 gr.) WITH 1 PER CENT BUTYL ALCOHOL, SUBCUTANEOUSLY



cells to 8,200 cells in 48 hours. It would be interesting to note the effect on the relative red cell count in using these three methods.

The chief objection to the subcutaneous use of sodium cacodylate being overcome by the addition of 1 per cent butyl alcohol as a local anesthetic, and the effect on the leucocytes being more stimulating in the cases studied, it would seem that the subcutaneous route is preferable to the intravenous.

SUMMARY

Sodium cacodylate is generally in use by the profession for various reasons.

Intravenous administration is often the method of choice.

Leucocyte counts on normal persons under controlled conditions showed a depressing effect in 17 cases given sodium cacodylate intravenously.

An average of 14 cases showed a tendency for the number of leucocytes to rise when sodium

cacodylate was administered subcutaneously. In an average of 16 cases given sodium cacodylate subcutaneously with 1 per cent butyl alcohol 1 per cent as a local anesthetic there was no change in the leucocyte count.

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ARCUS SENILIS AS AN ACCOMPANIMENT OF CARDIOVASCULAR DISEASE*

By L. C. Scott, M.D.,
New Orleans, La.

To workers in a cardiac clinic the relative frequency of arcus senilis and other degenerative changes in the eyes of the patients can hardly escape observation. This will especially be the case where white and colored individuals come to the notice of the same examiner, and the contrast in the racial incidence cannot fail to be appreciated.

Obviously, there is some reason why the degenerative changes in the cornea, known as arcus senilis, should be found more frequently in negroes than in whites. It is, however, by no means clear what the factor or factors are. An attempt has, accordingly, been made to classify the conditions, pathological, environmental, and otherwise, which are concomitant with the appearance of this disorder.

The fundamental cause of corneal opacity, distinguishing arcus senilis, has been a matter of some dispute. As far back as 1850, Canton[1] made the first reasonably careful examination of corneal sections, shaved off with a knife, and concluded on the basis of his simple tests with acetic acid and ether that the opacity was due to fat droplets. Canton cites the observations of previous workers in his article.

Arcus senilis also attracted the attention of Virchow and the elder His,[2] the latter stating that the fat globules are arranged in parallel rows as fine as threads crossing one another and forming a mesh. The fat droplets lie within the body of the cell. Virchow also looked upon arcus as being due to fat droplets preceded by parenchymatous degeneration.

Fuchs,[9] on the other hand, at least in his earlier work in 1891, considered the opacity as resulting from the deposit of hyalin concrements similar to these found in pinguecula. In the third edition of his text-book[3] this opinion has been altered and he concluded that fat droplets, as well as hyalin flakes and lime granules, are responsible. This view is also taken by Axenfeld.[4] De Schweinitz[5] states that "the nature of the fatty material in arcus senilis has not been determined," while Norris and Oliver[6] assert that the disease is due to hyaline degeneration and that "it was formerly believed to be due to fatty degeneration, but this is not the case." According to Theobald,[7] colloid degeneration of the superficial layers of the cornea causes arcus. The authors of other text-books and articles[8] all appear to be about of the same opinion, that arcus is a fatty change in the corneal cells, due to senile alterations of a somewhat nebulous kind.

The best piece of investigation into the pathological anatomy of arcus that I have been able to find is that of Takayasu.[9] He showed by staining methods carefully carried out on twenty different eyes from persons varying between twenty and ninety years that the arcus deposits took on the stains having an affinity for fat or fatty substances. These particles occur in the superficial layers of the corneal parenchyma, spreading from here gradually into the depth until the whole substance is invaded. The middle layers of corneal cells may be permeated to a lesser degree than those nearer the Descemet and Bowman membranes, and the process may extend farther toward the middle of the cornea than is suspected, a fact only to be detected by staining methods. Takayasu also appears to include lime salts and other hyaline particles in the deposits. Osmic acid, sudan, and hematoxylin-eosin stains brought out the fatty deposits while absolute alcohol caused their disappearance.

There is a further possibility that these deposits may be lime or more probably alkali soaps of the fatty acids. I was, however, not able to obtain pathological cooperation to confirm or refute this assumption.

The fact that arcus may occur in early years, even in childhood or youth as arcus cornea juvenilis is often mentioned. Attias,[10] citing the literature, states that arcus senilis without as-

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*From the Heart Station of the New Orleans Charity Hospital and the Department of Tropical Medicine, Tulane University Medical School.

TABLE I

TOTAL ARCUS SENILIS CASES

Age Groups	W. M.	W. F.	B. M.	B. F.	Totals	Per Cent
31 - 35			1		1	0.55
36 - 40			2		2	1.12
41 - 45	1	1	7	2	11	6.14
46 - 50	2	1	6	7	16	8.94
51 - 55	5		12	7	24	13.41
56 - 60	10	2	21	6	39	21.79
61 - 65	12		9	3	24	13.41
66 - 70	10	1	13	4	28	15.64
71 - 75	10	1	4	1	16	8.94
76 - 80	11	1	2		14	7.82
81 - 85	2				2	1.12
86 - 90	1				1	0.56
91 - 95	1				1	0.56
Totals	65	7	77	30	179	100.00
Per cent	36.31	3.91	43.02	16.76	100.00	

signable cause has been observed in persons of ten, fifteen, twenty and thirty years, the youngest observed being three months. There seems to be a tendency for these early cases to clear up in later years. Theobald[7] also says that it may occur in persons who are much too young to be designated senile. Ramsey[8] states that while the appearance of arcus is usually coincident with other changes indicative of old age such as grey hair, ossification of the cartilages, degeneration of the blood vessels, and so forth, it is frequently associated with fatty degeneration of the heart. There is a certain leaning toward hereditary tendency by some authors.

Whatever may be the true nature of arcus senilis, the consensus of opinion is that it is the objective manifestation of a deeper lying degenerative process, and this, regardless of the age at which it occurs. If the person is in advanced years it may, with truth, be regarded as part of the process of general decay, though it is a well known fact that many, if not the majority, of senile individuals, at least among the white race, show no evidence of the disease. On the other hand, if it occurs during adolescence or long before the senium, it is hardly allowable to assume presenile change as being responsible, still less as it has been found to disappear with advancing years. Other factors besides the physiological alteration of senescence must be assumed to be at work, and in this respect I think the study of arcus senilis incidence among a group of individuals whose principal complaint had nothing to do with ocular anomalies may be somewhat enlightening.

During the past years the routine procedures in the cardiac clinic of the New Orleans Charity Hospital have always included an examination of the eye for reflex, superficial disease of the bulb, and often times for changes in the fundus. The fairly frequent occurrence of arcus among these patients seemed to be a circumstance of more than passing interest.

For this study, 2,891 patients were selected as a representative group. Most of them were from the wards, but many were referred from the out-patient clinics. Of these, 63.57 per cent were white, and 36.43 per cent colored. They varied in age between one and ninety-six years, the largest number for any one age group being 294 for the period 46-50. Prior and subsequent to this age period, that is, after the fourteenth and before the seventieth year, the number of patients for each group is quite constant.

Of these 2,891 individuals, 179 showed arcus senilis of a greater or lesser degree of development. The youngest fell within the 31-35 year group; the oldest within the 91-95 year group. In spite of the fact that the whites predominate by far among the patients examined, 107, or 59.78 per cent, of those showing arcus were colored. The majority of instances occur between the ages of 51 and 70.

TABLE II

ARCUS SENILIS CASES ARRANGED ACCORDING TO DISEASE

Age Groups	Hypert. with or without H.D.	A.S. and Hypert.	Hypert. and A.S. and H.D.	A.S. and H.D.	H.D. Alone	No. Def. H.D.	Total	Per Cent
30 - 35	1						1	0.55
36 - 40				1	1		2	1.12
41 - 45	2			4	2	3	11	6.14
46 - 50	1	2	5	5	2	1	16	8.94
51 - 55	2	2	5	11	1	3	24	13.41
56 - 60	2	4	14	16	2	1	39	21.79
61 - 65		1	7	16			24	13.41
66 - 70	1		11	15	1		28	15.64
71 - 75			5	11			16	8.94
76 - 80		1	3	9	1		14	7.82
81 - 85				2			2	1.12
86 - 90				1			1	0.56
91 - 95				1			1	0.56
Totals	9	10	50	92	10	8	179	100.00
Per cent	5.03	5.59	27.93	51.40	5.59	4.46	100.00	

Note.— 44 or 24.79 per cent of Arc. sen. patients were definitely luetic.
152 or 84.76 per cent of Arc. sen. patients have sclerotic changes.
Abbrev.: Hypert.—Hypertension; A.S.—Arteriosclerosis; H.D.—Heart Disease.

TABLE III

ARCUS SENILIS PATIENTS WITH A.S. ACCORDING TO COLOR

	W.		B.			
Age Group	M.	F.	M.	F.	Total	Per Cent
36 - 40			1		1	0.66
41 - 45		1	3		4	2.63
46 - 50		1	6	5	12	7.89
51 - 55	4		8	6	18	11.84
56 - 60	8		22	4	34	22.37
61 - 65	10		11	3	24	15.79
66 - 70	10	1	11	4	26	17.11
71 - 75	9	1	5	1	16	10.53
76 - 80	10	1	2		13	8.55
81 - 85	2				2	1.31
86 - 90	1				1	0.66
91 - 95	1				1	0.66
Totals	55	5	69	23	152	100.00
Per cent	36.18	3.29	45.40	15.13	100.00	

In the occupational grouping the larger proportion of these patients with arcus senilis are seen to belong to the laboring class. Eighty-six, or 48.05 per cent, fall within this category, while the remainder ranged in the following order: no occupation, 31, or 17.32 per cent; housework, 30, or 16.76 per cent; miscellaneous occupation, 13, or 7.26 per cent, and the trades, 9, or 5.03 per cent.

Arterial changes, arteriosclerosis, with or without cardiac disturbance, was considered as a possible cause of arcus senilis. Among the total number (2,891) examined, 780, or 26.98 per cent, showed some signs of sclerotic degeneration, and of these, 62.43 per cent were white, and 47.57 per cent colored.

Tabulation (*Table II*) according to age group and cardiovascular disease also reveals that arcus senilis occurs most frequently among individuals with sclerotic or cardiac disease, or both together, with or without hypertension.

Of patients with arteriosclerosis in some form, 152, or about 19.5 per cent, showed definite arcus senilis. This means that 84.76 per cent of the total number of 179 were subject to arteriosclerotic changes.

Colored patients with both arcus and arteriosclerosis predominate, there being 39.47 per cent white to 60.53 per cent colored.

SUMMARY

There are several points in my opinion worthy of note: (1) the frequency and predominance of arcus senilis among members of the colored race. (2) Arteriosclerosis may be conducive to its production, or it may be a concomitant disease. The fact that the majority of arteriosclerotic patients showed no sign whatever of the eye lesion tends to modify somewhat the assumption of arteriosclerotic etiology. Finally, (3) the occurrence of arcus senilis predominantly among the laboring class, the colored members of which are very prone to both vascular thickening and luetic infection, may not be without significance.

However, none of these conditions, nor all of them, though probably contributory, is adequate to explain the frequent occurrence of arcus senilis among negroes. Two other factors may be tentatively considered: faulty nutrition and physical degeneration within an ethnic group. The first of these needs no discussion, for it is a well known fact that the average negro is not in a position to use discrimination in his diet. It seems very likely that wholesale degeneration, slow, but insidious, due to disease, principally syphilis, to susceptibility to pulmonary complications and, finally, to maladaptation to the white man's customs and usages is in progress. In this sense, then, arcus senilis may be looked upon as one of the indices of racial degeneration.

CONCLUSIONS

(1) Arcus senilis is proportionately more frequent among colored than among white patients suffering from cardiovascular ailments.

(2) Arteriosclerosis is quite commonly associated with this form of corneal degeneration.

(3) Arcus senilis is more frequently found among laborers and those who lead a strenuous physical existence than among those who lead less energetic lives.

(4) The probability of defective nutrition as a factor in the etiology cannot be disregarded.

(5) Arcus senilis may be a form of objective evidence that the negro has never quite adapted himself to an alien habitat and is undergoing gradual physical degeneration.

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NARCOLEPSY*

By ERNEST F. WAHL, M.D.,
Thomasville, Ga.

Narcolepsy, first mentioned by Westphal in 1877, and fully described by Gelineau in 1880, although a symptom complex of some pathological process as yet unknown, is still sufficiently uncommon to be of interest.

For many years the term "narcolepsy" was used indiscriminately in referring to various disorders of sleep. Lowenfeld, in 1902, stressed the fact that narcolepsy presented a double syndrome, consisting of diurnal attacks of sleep and cataplexy, and Adie later insisted on the presence of each before the diagnosis was justifiable.

*Received for publication August 20, 1930.

The rarity of the condition is illustrated by the fact that the Mayo Clinic series of 42 cases represented one in each 8,610 patients. Of this group 25 were idiopathic, the remaining 17 being secondary to some known cause. Definite cases have followed an attack of encephalitis, while in others there is no suggestion of such an infection having occurred.

Wilson gives the following classification of narcolepsy: (1) recurring attacks of diurnal sleep, associated with attacks of tonelessness or without attacks of tonelessness; (2) sleep attacks of prolonged duration, night and day sleeps running into each other; continuous sleep.

CASE REPORT

E. D., a colored male of ten years, was admitted to the John D. Archbold Memorial Hospital on March 15, 1930, complaining of constantly falling asleep.

The patient was the eldest of five healthy children. One sister died at the age of two years from some intestinal disturbance. There was frequent wetting of the bed up to four or five years of age, but this has gradually decreased until on admission it occurred only two or three times a year.

One year previously the patient began falling asleep at his meals. At about the same time his father noticed that he walked behind the plow, soundly asleep. Whenever he sat down or remained quiet for a few minutes, he immediately went to sleep. He slept quietly and soundly at night, but talked and mumbled during the attacks of diurnal sleep. On laughing the knees partly gave way and his head nodded forward, but he always righted himself without falling. He could usually be awakened in the field by the mere calling of his name, but the attacks occurring at the house required shaking. He usually answered when first shaken, but did not move for several seconds or a minute. He regained consciousness when shaken, but lacked voluntary control over the muscles and was unable to move. The attacks of diurnal sleep varied in frequency from five or six to a dozen each day.

Physical examination revealed a bright, alert and good natured colored boy of ten years. No evidence of disease of the nervous system or other parts of the body could be found.

Examination of the stools and urine revealed nothing abnormal. The basal metabolism gave a reading of plus 1.6 per cent. Lateral and antero-posterior films of the skull showed nothing abnormal. The blood Kahn and Wassermann reactions were negative. Blood chemical analysis revealed: non-protein-nitrogen, 30 mg.; calcium, 10 mg.; chlorides, 579 mg.; and blood sugar, 105 mg. per 100 c. c.

The spinal fluid was clear and under normal pressure; cells 1 per c. c. Wassermann, negative; globulin, negative; sugar, 90 mg. per 100 c. c. The spinal fluid was drawn at the same time that blood was drawn for chemical analysis.

Anti-epileptic measures have had no effect. Ten grains of potassium iodide three times a day gave questionable benefit.

SYMPTOMS

The outstanding features are the diurnal attacks of irresistible sleep and attacks of powerlessness or tonelessness brought on by emotional stimuli (cataplexy). It is essentially a chronic condition without mental deterioration. The symptoms are usually constant and reach their maximum intensity almost at the very beginning. Usually, the attacks of sleep appear first and are followed in a few weeks or months by the cataplectic attacks. However, in a few instances, the cataplexy has preceded the sleep attacks. Cases are recorded that have continued without any change of the character of the attacks for fifteen to twenty years. The cataplectic attacks have been absent entirely in a few cases.

The attacks of sleep are sudden and irresistible, regardless of the occupation or the danger of sleeping. Patients have fallen asleep on scaffolds, driving cars, during a meal, hanging on the grabirons of a train moving at 70 miles per hour, and so on. The duration of the sleep varies from a few seconds to thirty minutes. A light touch or calling the patients' name is usually sufficient to awaken them. Full consciousness is immediately regained and they seem bright and refreshed. If conditions are favorable, if the patient is in a warm room, or in a condition of postprandial repletion, the sleep attack may pass into normal sleep. In some instances the sleep is only apparent, as the individual can later relate what occurred during that interval. Wilson has found that most cases enjoy normal sleep at night, a few sleeping later in the morning while others seem tired during the day. Cave and others describe wild hallucinatory dreams and nightmares. It is sometimes possible for a patient to fight off a sleep attack for a few seconds or minutes. Attacks of tonelessness may replace the sleep attacks during an attempt to fight it off.

The attacks of tonelessness (cataplexy) are constant in their relation to emotion as the initiating cause. They have occurred when a sleep attack was being resisted. Following the stimulus most patients complain of their knees giving way under them or a general feeling of weakness, followed by collapse of the legs and sinking to the ground. The head falls upon the chest and the arms hang limp at the sides. The victim is not unconscious, but is in a state of helplessness from which he is unable to move. There is complete abolition of voluntary control, seldom lasting longer than two minutes. Usually, the patient is limp and quiet, but a few instances have been noted where there were trembling movements or slight twitching. At times a gurgling or grunting sound is made, but this is uncommon, complete silence being the rule.

Laughter most commonly precipitates the cataplectic attacks but any emotion, pleasant or unpleasant, is capable of doing so. Anger, the unexpected meeting of a friend, a tense moment in a card game or athletic event, or the sudden calling forth of unusual physical effort are known causes. One patient had an attack each time he attempted to chastise his children. Another described a short attack involving only the right arm when starting to serve a tennis ball. A third patient collapsed in a cross-country race when approaching a hurdle. He got up and immediately took the hurdle without difficulty. Many individuals with cataplexy have cultivated an artificial laugh in order to avoid the attacks.

Wilson was fortunate in being able to examine briefly a patient during a cataplectic attack. Deep reflexes were abolished and a positive Babinski phenomenon was elicited on the left side. This clearly shows that the condition is not functional.

TREATMENT

There is no satisfactory method of treatment. A few cases with low metabolic rates have improved somewhat on thyroid extract. Systematic rest periods throughout the day have been of some value in a few instances.

KIDNEY INFECTIONS*

By H. J. Farbach, M.D.,
Louisville, Ky.

Pyelitis or pyelonephritis probably never exists as a primary infection. Although it is a distinct clinical disease with its characteristic symptoms and points of differentiation from other renal and abdominal conditions, it is pathologically a secondary infection.

The healthy kidney seems unaffected by the action of bacteria. We see this demonstrated in every acute constitutional infection. The causative microorganisms are always present in the urine in fairly large numbers, especially during the height of the condition, but there is no associated evidence of renal lesion.

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*Clinic, General Clinical Session, Southern Medical Association, Twenty-Fourth Annual Meeting, Louisville, Kentucky, November 11-14, 1930.

By the term "pyelitis" or "pyelonephritis," we designate an infection of the urinary collecting apparatus, especially the renal pelvis, to distinguish it from infections that involve the secretory or cortical portion of the kidney.

Most renal infections are secondary and hematogenous in origin.

In the condition under discussion, the infecting microorganism enters the kidney from the circulation and passes through the tubules into the collecting apparatus, the pelvis. Investigators have shown that in passing through the walls of the tubule they produce tiny lesions, which heal very rapidly. Even so, with our present knowledge, it seems better to designate this condition as a pyelonephritis rather than a pyelitis.

In certain types of infectious diseases, the bacteria, staphylococci, colon bacillus, tubercle bacilli, are seen to pass through the kidney over long periods of time without pus or other associated elements in the urine to indicate any renal involvement.

In considering the etiology, we must determine what it is that makes it possible for an infection of the pelvis to take place. It is the old battle between the resistance of the host and the virulence of the invading bacteria, and here it must be the lowering of the natural resistance of the host. Probably the most active element in the lowering of this resistance is obstruction to the normal outflow of urine. The obstruction may be situated as low down in the urinary tract as the distal portion of the urethra, or it may be as high up as the uretropelvic junction. Constriction at the vesical neck, ureteral orifice and contractions in the ureter are the most frequent sites.

These obstructions may be congenital, or acquired by disease or injury. The fact that they interfere with normal outflow makes it possible for the bacteria excreted by the kidney to localize and multiply, because of the resulting urinary stasis and the lowering of local resistance, due to back pressure, metabolic disturbances, hyper- and hypo-acidity with the resulting toxic products in the circulation. Improper pancreatic function should not be overlooked.

In the presence of bacteria in the urine, if there is no pathological obstruction within the urinary tract, it is evident that some extrinsic element may interfere with normal outflow. The incident of pregnancy, with which pyelonephritis is often associated, is an example: although, the more carefully we go into the history of these cases the more we suspect the presence of something abnormal in the urinary tract prior to the conception.

The history of late bed-wetting, transient, but recurring urinary disturbances and attacks of influenza at most unexpected times, inclines one to suspect at least an earlier lesion that was brought to light by the more careful physical conduct during the pregnancy.

The symptoms of pyelonephritis are well known, easily recognized, and often overlooked or misinterpreted. In children and pregnant women the acute attack is often confused with an intestinal upset, the chronic type often diagnosed and treated as bladder trouble and cystitis.

Routine urinalysis, blood counts and blood chemical examination, physical examinations and renal function tests enable one to arrive at a definite renal diagnosis. The diagnostic procedure depends on the condition.

Acute cases with high temperature and general severe illness should be treated symptomatically. Abdominal palpation should elicit tenderness, pain or mass in the region of one or both kidneys. Urinalysis is very important and helpful. The presence of albumin is not of much importance, unless it is excessive in amount.

Pus in urine is a prime factor and eliminates a toxic nephritis. A stained specimen of dried sediment identifies the offending bacteria and directs our attention to certain localities for primary foci of infection. If little pus is present in a centrifugalized specimen never fail to stain for tubercle bacilli. A total renal function test should be made, as should a blood chemical examination and a plain x-ray.

If the acute symptoms subside, as they usually do, under mild diuretics and antiseptics, and the constitutional symptoms clear up, continue medication, add autogenous vaccines and mark time. Watch pus in the urine and the 'phthalein output. Some acute attacks clear up and need no other treatment. This is especially true in children. But these cases are few and far between. Don't let a few remaining pus cells in the urine beguile you into thinking they don't amount to much. Persistent pyuria means infection in the urinary tract somewhere, and do not be satisfied with anything less than a correct diagnosis.

There are not many conditions in the urinary tract today that must be left to guess work. A competent urologist with proper equipment leaves very little to the imagination. With cystoscopes, x-ray and proper laboratory technic, he can visualize the entire urinary tract. With the recent addition of uroselectan he is able to do this even

in cases where cystoscopy is impractical or impossible.

This new intravenous pyelographic solution is a valuable asset to our diagnostic equipment. Its present high price keeps it from being used more generally. Its preparation is easy for any experienced laboratory technician, the injection is a little tedious because of the heaviness of the solution, and it is painful if injected into the tissues. But I have had no unpleasant reactions even in small children and have obtained some very satisfactory pictures that could not have been made otherwise.

Treatment of chronic infections depends on their cause and severity. If obstruction is present, it should be removed. Calculi demand removal in most instances, and original foci of infection must be controlled. If the infection is bilateral and function about equal on both sides, ureteral dilatation, later lavage, together with urinary antiseptics, autogenous vaccines and tonics will clear up most of them. But they must be followed for several years, as they are prone to relapse. Remember, that elimination of the primary focus of infection is the most potent urinary antiseptic we have.

A word here about the new high priced urinary antiseptics. I have given them a fair trial and will continue to do so, but so far, I have failed to observe enough benefit to justify their continuance in the face of the high cost to the patient.

In unilateral infections that persist, with a gradually decreasing function, in spite of conscientious treatment, and where a compensatory increase in function is occurring in the healthy kidney, I believe it is to the best interests of the patient to remove the infected kidney.

The advisability of allowing an indwelling ureteral catheter to remain for days and even weeks at a time should be governed entirely by the condition presenting. There is no question but that it has saved some lives, prolonged others and produced irreparable damage in others.

Kidney disease is encountered rather frequently in children and has received considerable attention by urologists in the last few years.

Miniature cystoscopes have been perfected so that even infants can be studied as completely as the adult can. In fact, there are several men in the country who are today devoting most of their attention to urological diseases of children. These men are insisting on a routine cystoscopic examination of all children with a pyuria of several weeks' standing. Personally, I reserve for cystoscopic study those children in whom a practical working diagnosis can not be obtained by other methods.

All cases of pyelonephritis do not respond to treatment. In some this is due to the inability to locate and eradicate the primary focus of infection. In others, what was primarily diagnosed as a pyelonephritis proves later to be a slowly advancing bilateral pyonephrosis.

In the third group are the cases in which the infection and pathology seem to be limited to the urine collecting apparatus, but treatment does not produce much benefit either objectively or subjectively.

In pyelonephritis, the x-ray and pyelogram are of value, mostly in a negative way. If the kidney picture and pyelogram show little or no abnormality, it generally indicates that the renal lesion is confined to the urinary collecting apparatus.

An increase in the extra renal pelvis is generally noted. Ureterograms are important and helpful, demonstrating strictures, kinks and calculi with the co-existing ureteral dilatations above these obstructions.

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EDITORIAL DEPARTMENT

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PATHOLOGY OF DIABETES

It was noted recently in an editorial[1] in the *Journal of the American Medical Association* how very strongly current concepts of a disease are influenced by the accident of the personal interests of the first investigators; and that a slight change in the sequence with which clinical discoveries are made might conceivably result in establishing different forms of therapy. The field of protein sensitivity in particular is taken as an example. Because protein sensitivity was first studied by bacteriologists, who postulated that it was an immunologic phenomenon which they termed anaphylaxis, the logical therapy was taken to be protein immunization, and this inadequate conception has continued to dominate the therapeutic field.

Hyperglycemia and glycosuria have long been the most conspicuous symptoms of diabetes, and the pancreas, in necropsies of diabetics, has been the most carefully studied organ; because glycosuria was early produced by extirpation of the pancreas and later relieved by injections of pancreatic extracts. From the beginning of the study of diabetes the dominant diabetic error has been taken to lie in the metabolism of carbohydrates; the organ primarily at fault has been considered to be the pancreas.

In diabetes there are also characteristic changes in protein and fat metabolism, and in phosphorus and calcium metabolism, and if one of these had been observed first, the entire conception of diabetes might have been altered. There is always the possibility that necropsies of the diabetic with a consideration of the concomitant diseases to which he is most susceptible may throw further light upon the ultimate cause of the disease.

Is the pancreas the organ primarily at fault in diabetes? Dr. Shields Warren, of Boston, shows that even the refined methods of present day pathologists find no specific pancreatic lesion characteristic of diabetes. Many varieties of pathological change have been observed in the diabetic pancreas, each of which is found also in persons who have never had diabetes. Even among the patients who have died in diabetic coma, post mortem pathological diagnosis of diabetes is impossible, and a diabetic of several years standing may at necropsy show a pancreas to all intents normal.

Dr. Warren's small volume,[2] "The Pathology of Diabetes Mellitus," admirably surveys the findings in a series of 300 autopsies of diabetics. The diabetic, it has been said, rarely dies of his diabetes. There are certain secondary diseases to which he is more susceptible than are other patients. The first and most frequent concomitant condition, according to Warren, is arteriosclerosis, of a definite pathological type (atheromatous).

> "I have yet to see at autopsy a diabetic or to read the autopsy protocol of a diabetic, whose disease has lasted five years or more, free from arteriosclerosis, regardless of age.
>
> "As a natural sequel to the prevalence of arteriosclerosis . . . is the very frequent occurrence of myocardial injury due to coronary disease. A striking proportion of diabetic patients die of cardiac injury with or without coronary occlusion and infarction."

Acute infection was the cause of death in 126 of Warren's 300 fatal cases. Throughout the volume he emphasizes the fact that infection is the greatest peril which the diabetic has to face.

Cholecystitis and cholelithiasis, Warren agrees with other authors, are much more frequent in diabetics than in persons suffering from other diseases.

Detailed routine examination of all the endocrine organs is not reported. The suprarenals

1. Therapeutic Relativity. Editorial. J. A. M. A., 6:196, Jan. 17, 1931.

2. Warren, Shields: Pathology of Diabetes Mellitus. Lea & Febiger, Phila., 1930.

were examined in 300 cases, but no significant lesions were found. In 27 cases free from stigmata of pituitary disease, the hypophysis was found to be normal. In cases of hyperthyroidism examined by Warren, no change in the pancreas was demonstrable, although others have reported various degenerative changes of the pancreas following hyperthyroidism. Routine examination of the thyroid of this series of diabetics is not reported in this volume. The peaks of incidence of diabetes, Warren notes, occur at the time of puberty in children and at the menopause in adults. This would imply, perhaps, a relation of mutual stimulation of pancreas and gonads. Examination of the parathyroids is not mentioned.

In exhaustive autopsies of persons and animals which have died of a deficiency of one of the glands of internal secretion, it is very common to find involvement of one or several others of the ductless glands. This is true in Cushing and Davidoff's[3] reported cases of acromegaly, in Well's[4] cases of disease of the suprarenal cortex, and in reports of experimentally produced endocrine disease in lower animals.[5] The reciprocal relations of the anterior lobe of the pituitary and the gonads are now well established. Anatomical evidence points repeatedly to the interdependence of the endocrine system; and failure of one of the ductless glands of an experimental animal induces successive histological degeneration of other glands. It is possible that the pathology of endocrines other than the pancreas has not been sufficiently studied in diabetic autopsies.

Diabetes is one of the most fertile fields for clinical research, in spite of the continuous intensive cultivation of the plot, which has gone on throughout this century. If the disease is properly treated the patient lives to be studied over a long period, during which he recognizes the necessity of medical care and welcomes observation. He is one of the patients in medical practice who is most benefited by therapy. This little book of Shields Warren's will furnish a stimulating, instructive, and very readable reference for anyone engaged in the treatment of diabetes.

3. Cushing, Harvey; and Davidoff, Leo: Pathological Findings in Four Autopsied Cases of Acromegaly, with a Discussion of Their Significance. Monographs of the Rockefeller Institute, No. 22, Apr. 23, 1927.

4. Wells, H. G.: Addison's Disease with Selective Destruction of the Suprarenal Cortex. Arch. Path., 10:499, Oct. 1930.

5. Smith, P. E.: Hypophysectomy and Replacement Therapy in the Rat. Amer. Jour. Anat., 45:205, Mar. 15, 1930.

THE ANTI-VIVISECTION BILL

Although science is said to be the moving spirit of the present age, sporadic attempts to hinder scientific progress still appear, backed with considerable zeal by misinformed laymen. To the physician, whose whole training rests on an understanding of animal physiology, the necessity of animal studies under controlled conditions seems as unquestionable, the idea of forbidding it as uncivilized, as the idea of enforcing a belief in witches; and he is sometimes caught unawares by lay agencies which, with the best intentions, would cripple his efforts in behalf of humanity, and bind him hand and foot to the cruel necessity of standardizing his drugs and doing his experimental work upon his fellow man.

Representative Zihlman, of Maryland, introduced into the House of Representatives, in 1929, a bill (H. R. 7884) to prohibit experiments upon living dogs in the District of Columbia. This bill was reported upon for the Committee on the District of Columbia, which investigated it, by Mr. McClintock, of Ohio, in July, 1930, "with the recommendation that the legislation do pass."

REPORT FROM THE COMMITTEE ON THE DISTRICT OF COLUMBIA TO ACCOMPANY H. R. 7884

"The Committee gave ample opportunity to the proponents and opponents of the bill to express their views and present their arguments, and feels that the testimony of the proponents outweighs that of the opponents and should be accepted.

"One of the exhibits submitted to the committee was an article in the *Journal of the American Medical Association* of July 16, 1927, by Dr. W. W. Hall, Lieutenant, Medical Corps, United States Navy, and Dr. E. G. Wakefield, of Washington, D. C., which contains a table showing 'Experimental heat-stroke in dogs.' The table shows that 7 out of the 10 dogs used for experiment died in less than a day, 4 in less than 15 minutes, 2 in 12 hours, and 1 lived for 23 hours.

"Dr. John Sturgis Codman, Vice-President of the International Conference on the Investigation of Vivisection, presented information to the Committee that dogs are given out freely from the District pound to the Hygienic Laboratory, and other Government controlled and operated institutions, under the direction of Dr. Fowler, the health officer, but that advice was given by District officials that it was prohibitive to give out dogs for vivisection purposes to individuals or to private medical colleges, such as the George Washington University and the Georgetown University. Doctor Fowler submitted that from March 1, 1929, to February 29, 1930, 315 dogs had been furnished the Federal departments of the Government in the District of Columbia, and that during this past year, the number had been reduced by 50 per cent.

"It is the contention of the proponents, whose view the Committee has accepted, that the dog does not react in the same way as the human does, and that therefore the dog is not an accurate criterion for man in any form of experiment, and should not be subjected to such extreme pain and intense suffering as they are called upon to endure, when the benefits accruing to humanity are practically nil."

This bill is aimed at the dog, but its proponents say that that is because it is easy to create sympathy for the dog. All animal experimentation would eventually be prohibited if they have their way. It is said that the new Institute of Health (Hygienic Laboratory) is especially attacked in the Committee's testimony. The passage of this bill would destroy that organization.

RESOLUTION OF THE SOUTHERN MEDICAL ASSOCIATION UPON THE USE OF LIVING ANIMALS FOR EXPERIMENTAL PURPOSES

The Southern Medical Association meeting in Louisville in November, 1930, passed the following resolution without a dissenting vote:

Whereas, various individuals and organizations have opposed the use of live animals in experimental medicine and surgery, and in medical and surgical teaching, and

Whereas, the use of such live animals has contributed greatly to the advancement of medical knowledge, the prolongation of life, reduced human suffering, diminished the mortality rate in many diseases among both men and animals, and the continuation of such use is essential to the maintenance of public health and the continued progress of our battle against disease and death, therefore, be it

Resolved, that the Southern Medical Association approve the proper use under humane safeguards of live animals in experimental medicine and surgery as well as in medical teaching, and oppose the doctrines of those individuals and organizations who would hamper the use of live animals for such purposes.

ARGUMENTS AGAINST STUDIES OF LIVING ANIMALS

One notes in the report on the proposed bill the statement that "the dog is not an accurate criterion for man in any form of experiment." This remark can arise only from a deep ignorance of scientific theory and method. Upon the profound similarities as well as differences of reaction of men and animals, all modern medical methods are based. The first knowledge of pancreatic juices was obtained nearly two centuries ago by experiments on the dog. The conquest of pernicious anemia by liver extract was made possible by work on the dog. If insulin, discovered through experiments on dogs, is of great benefit in the treatment of human diabetes; if diphtheria antitoxin manufactured in the tissues and stored in the blood serum of a horse can prevent a disease which was formerly one of the worst scourges of childhood; if an operation upon a dog can suggest a life-saving improvement in technic of the setting of a human fractured bone; why should one pass a law that all stray dogs must be chloroformed without examination? It is not pet dogs which this law proposes to protect, but dogs from the city pound, dogs which are unclaimed and are otherwise destined to die.

Everyone admits the necessity of drowning superfluous puppies and kittens except the inhabitants of India, whose streets are overrun with diseased and starving animals. Every American city maintains a pound for the elimination of superfluous animals. What a frightful waste, one might say, what cruelty, to forbid any use of these animals, which might frequently earn a comfortable long life for themselves under easy laboratory conditions.

The layman who does not understand laboratory methods should accept expert opinion upon them. In the first place, with the tremendous development of anesthesia in the past twenty years, it has become increasingly rare for an animal under study to suffer, even if the experiment in question be a painful one, and actually the majority of present day methods of study are not painful.

Secondly, any profession must be judged eventually by the men who fill its ranks. No higher class of men, intellectually or morally, can be found than those who by carefully and painstakingly controlled experiments upon living animals have laid the foundation of present day medical methods. There are no villains among them. There is no one who likes to inflict pain.

The study of living animals has brought medicine, in a comparatively brief period, a thousand years beyond the stage of the medicine men of savage tribes. It is to be hoped that a few zealous and misguided persons will not jam the machine, or break the mainspring of medical progress, by foolish laws forbidding the use of waste animal material.

Members of the Southern Medical Association can assist in the defense of medical standards by writing their congressmen to oppose bill H. R. 7884, and with it all proposed antivivisection bills, as measures seeking to hamper the development of therapeutic methods, and to return medicine to the backwoods of ignorance and superstition.

DR. OSCAR DOWLING

IN MEMORIAM

The first Secretary of the Southern Medical Association, the Editor of its first official journal, and its President in 1915, was Dr. Oscar Dowling, of Shreveport and New Orleans, Louisiana. He was one of the able and enthusiastic young men who first charted the Association's course, and he missed few meetings of the Southern Medical Association from its organization through the immediately past convention in Louisville, in November.

Born in Alabama in 1866, he studied extensively in Southern colleges and in well known Eastern and European hospitals and clinics. He began the practice of eye, ear, nose and throat work in Louisiana, and was soon after appointed a member of the Louisiana State Board of Health by the governor. He became president of the Board of Health in 1910, was reappointed to that office by successive governors over a period of eighteen years, and remained in charge of the public health work of the state of Louisiana until 1928, when he was displaced by the newly elected Governor Long.

The health department of Louisiana was in a backward condition when Dr. Dowling took charge of it, but he raised it to a high rank among the states; and because of his ability and attainments he was recognized as one of the leading men in public health work in America. His outstanding achievements were in the department of vital statistics, the registration of births and deaths, the establishment of higher standards of production and handling of milk, the improvement of public markets, and the education of the public along public health lines, particularly by means of health cars, which he sent into all rural districts of Louisiana, and even to the Pacific coast.

Since his official retirement from public health activities, he devoted his time to further development of the dairy industry, in which for years he had been interested. He met a tragic and accidental death on January 2, 1931, as he was en route to Shreveport, when he was struck and killed by a train on a train ferry.

Dr. Dowling was a man of great kindliness, friendliness, geniality, and wit, one of the best known and best loved physicians in Louisiana. His distinguished public services will long be remembered in the South.

Book Reviews

Protozoan Parasitism of the Alimentary Tract. By Kenneth M. Lynch, M.D., Professor of Pathology, Medical College of the State of South Carolina, Charleston, South Carolina. 258 pages, illustrated. New York: The Macmillan Company, 1930. Price, cloth, $3.75.

The author deplores the fact that the average practitioner knows little about protozoology and cites as a reason that the recent work has been of a lower calibre and has tended to confuse the subject. He also feels that the diagnosis of protozoan infection is often made on the finding of an ameba, or moving object, when further study and more knowledge would reveal the mistake.

The first chapters constitute an introduction to protozoology. The life, dissemination and prevention of infection from protozoa is taken up. The succeeding chapters are on amebae, the flagellates, the ciliates, the coccidia and blastocysts. Under each of these groups the genera that are pathological to man are fully discussed as to prevalence, distribution, transmission, experimental infection, cultivation, habitat, diagnosis and treatment.

This is not a book for the protozoologist, but for the student and practitioner, and in this respect it fills its mission admirably.

Practical Therapeutics. By Hobart Amory Hare, B.Sc., M.D., LL.D., Professor of Therapeutics, Materia Medica and Diagnosis in the Jefferson Medical College of Philadelphia; Physician to the Jefferson Medical College Hospital. New (21st) Edition, 1,104 pages with 145 engravings and 6 plates. Philadelphia: Lea & Febiger, 1930. Price, cloth, $7.50.

In this new edition of Dr. Hare's intensely practical text, a great many changes have been made, a large number of new drugs have been added, and new uses for the old familiar ones have been given.

The present conception of the use of calcium salts in dropsy and tetany is discussed at length. Ammonium chloride has long been prescribed to loosen mucus in respiratory infections. Hare states, "Full doses of this salt often induce active diuresis in cases suffering from renal dropsy." It may also be used as a urinary antiseptic in *B. coli* infections. Tartar emetic is very efficacious in curing chancroid when given intravenously. Bismuth is given a place in the treatment of lues as a "very valuable remedy." While the use of digitalis in pneumonia has been rather a moot question, opinion seems to favor its use in selected cases. The method of administration and care in prescribing are fully detailed. Ventriculin, viosterol, cincophen, salyrgan and hexylresorcinol, are among the newer drugs which are included.

It has been stated that surgical success in the treatment of gall-bladder disease is only 25 per cent, and that medical treatment should be attempted before operation in most cases. There is no mention of such treatment in the text.

The system of cross references along with the listing of each drug or disease in alphabetical order makes the contents very accessible. The importance of a book of this character cannot be overemphasized.

Primer on Fractures. Prepared by the Cooperative Committee on Fractures under auspices of Section on Surgery, General and Abdominal, and Section on Orthopedic Surgery in cooperation with Department of Scientific Exhibit of the American Medical Association. Illustrated. 55 pages. Chicago: American Medical Association, 1930. Price, $1.00.

As stated by one of those responsible for its publication, the "Primer" is intended for use by both students and practitioners. It is not for the purpose of standardizing treatment, but to suggest what constitutes acceptable methods of treatment. It contains the material which found favorable responses on the part of the visiting physicians among the Scientific Exhibits of the American Medical Association. The legends were written by the members of the Cooperative Committee on Fractures, Drs. Allison, Darrach and Speed. Interleaved, it will be noticed, are pages for notes by students or teachers.

The charts consist of large drawings with explanatory notes, detailing in each the most widely accepted form of treatment of the commonest and most typical fractures. There are fifteen such charts and an additional two devoted to describing the manufacture and application of plaster of paris bandages. While the book is not pretentious, its purpose of emphasizing certain fundamentals of fracture treatment in an unmistakable and unforgettable manner is accomplished.

Treatment of Epilepsy. By Fritz B. Talbot, M.D., Clinical Professor of Pediatrics, Harvard University Medical School; Chief of Children's Medical Department, Massachusetts General Hospital. 308 pages. New York: The Macmillan Company, 1930. Price, cloth, $4.00.

This monograph follows the customary order, dealing briefly with the history, etiology, pathology and prognosis of epilepsy. It is divided into two sections, the second section being devoted entirely to the dietary treatment. It is pertinent that the ketogenic diet should occupy almost one-half of the book. The recent advances in this form of treatment have opened new fields in the etiology of the "convulsive-states" and their alleviation. The author goes into the details of the management of the ketogenic diet, supplementing this with very simple diet tables.

Only one paragraph is given to the subject of migraine, a disease which is said to be closely related to the epilepsies.

This book is practical, and attractive in appearance.

Selected Readings in the History of Physiology. By John F. Fulton, M.D., Formerly Fellow of Magdalen College, Oxford; Sterling Professor of Physiology Yale University School of Medicine. 317 pages with abundant and unusual illustrations. Springfield, Illinois: Charles C. Thomas. Price, cloth, $5.00.

This contribution should be of considerable aid for the introduction of premedical and medical students to the general field of physiology.

Dr. Fulton has arranged the readings according to the subjects of: general principals, circulation, capillaries, respiration, digestion, and so on. Seventy-nine investigators are represented. Many of the original descriptions of great discoveries and contributions are included. The extracts of the original words of the great physiologists from the time of Aristotle are quoted, or are translated into English, when the original is in a foreign language. There are many new illustrations not found in similar works.

The work could perhaps have been improved by the inclusion of organized readings on the blood, heart, metabolism, and secretion. It will make the reader more desirous of studying the originals from which the extracts were taken.

Episcopal Hospital Reports. Medical and Surgical Reports of the Episcopal Hospital, Philadelphia. Volume VI. Philadelphia: Wm. J. Dornan, 1930.

This volume is published to commemorate the Episcopal Hospital's seventy-fifth year. The first few pages of the book are devoted to the members of the staff, both administrative and professional. Following this is a statement from the Superintendent comparing the activities of the hospital in the years 1853 and 1928. The memorial by Dr. Ashurst on the late Richard Hickman Harte depicts this physician's assistance to the hospital and contributions to medicine. Other members of the staff have written articles covering the activities of their special departments which compare favorably with those found in books of similar character.

Emergency Surgery. By Hamilton Bailey, F.R.C.S. Eng., Late Surgeon, Dudley Road Hospital, Birmingham. Volume I, Abdomen and Pelvis. 380 pages with 324 illustrations, some of which are in color. New York: William Wood and Company, 1930. Price, cloth, $8.00.

While the author states, "I have pictured a patient stricken with an acute abdominal catastrophe," practically any abdominal condition could come under this heading, at least for the purpose of making a diagnosis. All phases of abdominal surgery are covered in this volume, except cholecystectomy. The introductory chapter deals with the sterilization and care of the hands, sterilization of the patient's skin and the armamentarium. The point is stressed that only those instruments which are necessary to the operation should be retained.

The author seems to prefer the gridiron incision, and makes use of it in exploratory operations. The right rectus would seem more efficient if the patient is a male, and the midline in a female. This obviates the necessity of two incisions in case of a mistaken diagnosis, and gives more room, which an isolated surgeon will need for his less dexterous hands. Three reasons are given for drainage of the abdomen: "(1) the presence of free purulent material in the peritoneal sac in considerable quantities; (2) an oozing surface where perfect hemostasis is impossible, and (3) the presence of an abscess, when the peritoneal coat is damaged. And further, the cavity should not be drained more than forty-eight hours.

The Ochsner-Sheren method of delayed treatment of appendix cases over 48 hours old is given in detail. And after using it in several hundred cases the author praises it highly. Each abdominal condition is thoroughly covered as to diagnosis, and the treatment is based on actual cases seen by the writer.

The use of the suction apparatus in keeping pus fields clean, the Ryle small stomach tube in gastric lavage, free omental graft in gastric perforations, methods of suturing the liver, spinal anesthesia as a method of choice in intestinal obstruction and the prophylactic use of anti-gas-gangrene (*B. Welchii*) serum in intestinal obstruction are some of the practical hints in the book.

Technical language is reduced to a minimum, a few plain, direct words sufficing to give a clear description of the procedures. Well illustrated and printed, its practibility should make it popular.

A Textbook of Histology. By Alexander A. Maximow, Late Professor of Anatomy, University of Chicago. Completed and Edited by William Bloom, Assistant Professor of Anatomy, University of Chicago. 833 pages with 604 illustrations, some in colors. Philadelphia and London: W. B. Saunders Company, 1930. Cloth, $9.00.

Bloom, and his colleagues, have posthumously completed the text which the late Professor Maximow started. The book "was to be based as far as possible, both as to text and figure, on human material, and the functional aspect of the structures described were to be emphasized." A glance through the pages reveals how well this has been done.

"Prof. Maximow left, in rough manuscript, sections on the blood and connective tissue, the gastro-intestinal tract, the blood, vascular and lymphatic system, the spleen, the integument and the mammary gland."

The introductory chapter deals with the methods of study of the cell, structure and activities. Each tissue and organ is then described in minute detail. The pages abound with photomicrographs, and sketches, and where these were not sufficient, excellent diagrammatic drawings picture the subject to the student. Histologic technic is not described. The bibliography contains only the key references to the subject in hand. This is an admirable work.

A Text-Book of Medicine. By American Authors, Edited by Russell L. Cecil, A.B., M.D., Sc.D., Assistant Professor of Clinical Medicine in Cornell University; Assistant Visiting Physician to Bellevue Hospital, New York City; Associate Editor for Diseases of the Nervous System, and Foster Kennedy, M.D., F.R.S.E., Professor of Neurology in Cornell University; Head of Neurological Department, Bellevue Hospital, New York City. 1592 pages without illustrations. Second Edition. Philadelphia: W. B. Saunders Company, 1930. Price, cloth, $9.00.

The fact that there have been two reprints and a second edition of this book within four years speaks for its acceptance by the medical profession. Five of the original contributors have died since the publication of the first edition. Richard P. Strong has written the chapter on yaws; H. R. Muller the chapter on yellow fever; William H. Park has revised the chapter on diphtheria and Ernest E. Irons the chapter on the diseases of the pleurae. These were in the first edition written by Henry J. Nichols, Hideyo Noguchi, John Phillip and Abraham Zingher, respectively. New chapters have been added to the text, Edward B. Francis contributing the article on tularemia, Raymond L. Ditmars an article on snake venom poisoning, Charles P. Emerson an article on atelectasis of the lungs, E. E. Tyzzar an article on creeping eruption, Horace S. Baldwin a short article on Oroya fever, Victor E. Heiser a review of a *Brucella abortus* infection, Malcolm Goodridge an article on essential hypertension, Thomas Ordway and L. W. Gorham an article on agranulocytic angina, and Russell L. Cecil a new chapter on arthritis.

There has been extensive revision of the text throughout the book and, although one might take exception to minor details, the book, on the whole, can be highly recommended.

Pathology. By E. T. Bell, M.D., Professor of Pathology in the University of Minnesota, Minneapolis, Minn. 627 pages, with 316 engravings and 2 colored plates. Philadelphia: Lea & Febiger, 1930. Price, cloth, $8.00.

In this volume, presenting the essential facts of pathology to the medical student, the introductory chapter discusses the predisposition to disease. Very briefly are taken up, injuries due to mechanical, physical and chemical agents. The chapter on circulatory disturbances includes hyperemia, anemia, hemorrhage and hemorrhagic diseases, thrombosis, embolism and edema. Following the chapters, on retrogressive tissue changes, inflammation, tuberculosis, syphilis, leprosy and glanders, the mycoses and tumors, the pathological changes of the separate organs are discussed.

Throughout the text the author follows a proposed nomenclature, which corresponds to clinical entities and at the same time is based on etiology and pathology. Well planned and comprehensive, the brevity is somewhat detracting. This could be balanced by readings from the bibliography, which has been selected from the more accessible literature.

Tropical Medicine in the United States. By Alfred C. Reed, M.D., Professor of Tropical Medicine, The Pacific Institute of Tropical Medicine within the George Williams Hooper Foundation for Medical Research of the University of California. 410 pages, with 60 illustrations. Philadelphia and London: J. B. Lippincott Company, 1930. Cloth, $6.00.

The author has indicated that the purpose of this book is to bring before the medical profession of the United States tropical diseases which may be encountered in practice here. The subject is presented under the following headings: protozoal diseases; spirochetal diseases; bacillary diseases; helminthic diseases; diseases of unknown etiology; mycotic diseases; metabolic diseases; arthropod parasites; and miscellaneous. Certain diseases are worthy of special comment.

Under protozoal disease, amebiasis is worthy of special mention except that the section on treatment is too much of a routine to take care of any but the average case. The section on malaria compares favorably with the average textbook presentation of this disease but not with the usual treatise on tropical medicine. The reason for including rabies in the text is not apparent.

Under spirochetal diseases, the sections on relapsing fever, yaws, and gangosa are short but clearly written.

Bacillary dysentery is given in detail. Of the other bacillary diseases, plague, undulant fever, leprosy, and cholera are given sufficiently fully to be of value; but it seems strange that the author mentions only hydnocarpic acid of the chaulmoogra oil derivatives. The inclusion of tularemia in tropical diseases is questionable.

The greater part of the chapter on helminthic diseases is given to filiariasis, hookworm disease and schistosomiasis. Despite authoritative statements to the contrary, the author contends that carbon tetrachloride should not be given with oil of chenopodium.

Under the title "Diseases of Unknown Etiology," yellow fever, dengue, typhus fever group, sprue are the most important subjects presented. Although short, the text can be used for a working basis.

There is a section given to mycotic diseases.

Under metabolic diseases, beriberi and pellagra are briefly but clearly presented.

A chapter is devoted to arthropod parasites which is not sufficiently full to be used as a working text.

The final chapter covers miscellaneous subjects such as tropical ulcers; heat diseases; personal hygiene; and tropical climatology.

The book is well illustrated and as a teaching manual might be useful. However, many more practical books on tropical medicine are available.

Elementary Zoology for Medical Students. By L. A. Borradaile, Sc.D., Fellow and Tutor of Selwyn College, Cambridge, and Lecturer in Zoology in the University. 397 pages, illustrated. London and New York: Oxford University Press. Cloth, $3.50.

This is designed to aid students in preparing for the first medical examinations. A few minor alterations have been made. Chapters on the mosquito, housefly and tape-worm have been inserted. The discussion is very succinct.

A Synopsis of Medicine. By Henry Letherby Tidy, M.A., M.D., B.Ch. (Oxon). F.R.C.P. (Lond.), Physician to St. Thomas' Hospital. Fifth Edition, revised and enlarged. 1,032 pages. New York: William Wood and Company, 1930. Price, cloth, $6.00.

Covering the advances made in the past five years many alterations have been made in the text. Tularemia, *B. abortus,* South American trypanosomiasis, American dermal Leishmaniasis, yaws, rat-bite fever, post-vaccinal encephalitis, Rocky Mountain fever, psittacosis, dysphagia associated with anemia, acute hemorrhagic nephritis, sickle cell anemia are new additions.

The sections on vitamins, encephalitis lethargica, diarrhea, ulcerative colitis, cholecystitis, dyspepsia, and pneumococcal peritonitis have been thoroughly altered and rewritten. Following the work of Drs. Dick and Dick, scarlet fever is now discussed in the section on bacterial diseases. The section on yellow fever has been transferred back to the section on diseases of unknown origin.

Perhaps no other book offers such a comprehensive array of knowledge in such little space. The undergraduate finds it most useful in preparing for examinations, the graduate in revising his knowledge; and for a quick glance in a puzzling case, he does not have to wade through a mass of superfluous verbiage.

Southern Medical News

ALABAMA

Dr. W. D. Partlow, Superintendent of the Alabama Insane Hospitals, recommends a building appropriation of $1,100,000 if the State is adequately to care for its insane and mentally defective. Among recommendations to the Legislature is an appropriation of $100,000 to provide for segregation and separate treatment of white criminals and drug and alcohol addicts. Other recommendations call for extensions to present buildings and new buildings providing for 725 new beds for white patients, a nurses home for women, an auditorium for chapel and recreation, and buildings and equipment to accommodate 400 new patients at the negro state farm colony. All recommendations contained in the report to the Governor have the approval of the Board of Trustees of the Hospitals.

Deaths

Dr. J. D. Dabney, Birmingham, father of Dr. M. Y. Dabney, Editor of the JOURNAL, aged 82, died December 25, of pneumonia.

Dr. Thomas James Bickley, Birmingham, aged 75, died November 24 in a hospital at Atlanta, Georgia.

Dr. Pugh Ulpian Brown, Troy, aged 61, died November 24 in a hospital at Mobile.

Dr. William Pounce Chalker, Dothan, aged 58, died suddenly November 27 of heart disease.

Dr. Manley Alfred Davis, Gadsden, died recently.

Dr. Frances Asbury Webb, Calvert, aged 70, died October 22.

Dr. Roy Hart Norris, Mount Pleasant, aged 57, died October 18 of chronic pulmonary abscess.

Dr. Ferdinand Hammond Turner, Meridianville, aged 49, died December 12.

ARKANSAS

Conway County Medical Society has elected Dr. W. H. Bruce, Morrilton, President; Dr. H. E. Mobley, Morrilton; Dr. A. L. Goatcher, Plumerville, Secretary-Treasurer, all reelected.

Craighead-Poinsett Medical Society has elected Dr. Ralph Sloan, Jonesboro, President; Dr. W. H. Moreland, Tyronza, First Vice-President; Dr. Chas. Bates, Lake City, Second Vice-President; Dr. H. A. Stroud, Jonesboro, Secretary; Dr. R. M. Jernigan, Jonesboro, Treasurer.

Hot Springs Academy of Medicine has elected Dr. W. L. Snider, President; Dr. O. L. Biggs, Vice-Pres-

ident; and Dr. Loyd Thompson, Secretary, all of Hot Springs.

Mississippi County Medical Society has elected Dr. Paul L. Tipton, Blytheville, President; Dr. V. R. Fox, Manila, Vice-President; Dr. F. D. Smith, Blytheville, Secretary-Treasurer, reelected.

Pulaski County Medical Society has elected Dr. J. H. Sanderlin, President; Dr. J. A. Summers, Vice-President; Dr. Earle H. White, Secretary; and Dr. Wm. R. Bathurst, Treasurer, all of Little Rock.

A sectional meeting of the American College of Surgeons for members in Arkansas, Oklahoma, and Texas, was held in Little Rock recently. Dr. W. F. Smith was Chairman of the Committee on Arrangements, Dr. H. Fay H. Jones, Secretary of the local Committee, and Dr. Dewell Gann, Jr., was in charge of publicity.

Dr. O. H. King, Hot Springs, is the new President of the local Kiwanis Club, and Drs. Tribble, Proctor and Sullivan are on the Board of Governors.

Dr. D. A. Rhinehart, Little Rock, was in Los Angeles in December attending the meeting of the Radiological Society of North America.

The University of Arkansas School of Medicine, Dr. Frank Vinsonhaler, Dean, has entered into an agreement with the City General Hospital of Little Rock to take charge of charity cases for teaching purposes.

Deaths

Dr. Robert O. Chambers, Centerton, aged 77, died October 30 of chronic endocarditis.

Dr. C. S. Miller, Hot Springs, died July 23 of cerebral hemorrage.

DISTRICT OF COLUMBIA

The U. S. Treasury Department received its first contribution to aid in development of scientific investigation by the new National Institute of Health, a gift from the Chemical Foundation, Incorporated, of $100,000. No announcement has been made respecting the program of investigation now permitted as a result of the gift.

At the request of President Hoover, the White House Conference, composed of over 1,200 National Leaders in Public Health, Education and Public Welfare, met in Washington, November 19-22.

Dr. Mary O'Malley was recently entertained by the medical staff of St. Elizabeth's Hospital, Washington, on the twenty-fifth anniversary of her service at the hospital.

Deaths

Dr. James Edson Miller, Washington, aged 69, died October 16 in the U. S. Naval Hospital.

Dr. Edward Rogers Noyes, Washington, aged 60, died November 18 of lobar pneumonia and heart disease.

FLORIDA

Dr. Bundy Allen, Tampa, was installed as President of the Radiological Society of North America at the annual meeting in Los Angeles in December.

Dr. W. C. Chowning, New Smyrna, spent three months at the University Hospital, Baltimore, Maryland, studying rectal and venereal disease work.

Dr. Kenneth Phillips, Miami, did post-graduate work in Chicago recently.

Dr. John R. Rose has moved from Titusville to Unadilla, Georgia.

Dr. W. D. Anderson, Largo, spent considerable time visiting clinics in Boston recently.

Dr. and Mrs. Max Ghertler, Miami, have returned from a visit to France, Switzerland and Germany.

Dr. H. E. Palmer, Tallahassee, has been chosen President of the Tallahassee Kiwanis Club for the ensuing year. He is also a member of the State Board of Health.

Dr. A. L. Mills, St. Petersburg, spent two months taking postgraduate work in Philadelphia.

Dr. J. William Jones, Ft. Myers, was in Atlanta, Georgia, during the month of October taking clinical work at Grady Hospital.

Dr. E. S. Couric, Miami, was in New York taking post-graduate work during the month of September.

Dr. Henry Hanson, State Health Officer, and Dr. Lucile Spire Blachly, Director of the Bureau of Child Hygiene of the State Board of Health, Jacksonville, attended the White House Conference on Child Welfare in Washington in November.

Dr. Clarence D. Rollins, Jacksonville, attended hospital clinics in Baltimore following the meeting of the American College of Surgeons.

Dr. Gideon Timberlake, St. Petersburg, spent the summer at his Atlantic City office and in Baltimore, Philadelphia and New York clinics.

Dr. T. H. Wallis, Ocala, recently studied post-graduate instruction in surgery at the Polyclinic Hospital at New York.

Dr. A. W. Knox, Sanford, has returned from Carlisle Barracks, Pennsylvania, where he took a six weeks' course at Medical Field Service School. He was awarded the McCamant Medal given each year to the honor student in military hygiene and sanitation.

A State Public Health Association was formed at Jacksonville recently, and Dr. Henry Hanson was elected president; Dr. George N. McDonell and Dr. Noble A. Upchurch, Vice-Presidents; and Dr. Stewart G. Thompson, Secretary-Treasurer.

Miss Nettie Vanderwork, who has been connected with the Tampa Hospital, Tampa, for more than a year as Assistant Superintendent, was recently appointed Superintendent of Nurses, succeeding Nellie Harding, resigned.

Dr. D. Ward White, Miami Beach, and Miss Agnes L. Lamb were married recently.

Dr. Henry Fuller, Mulberry, and Miss Edith Record, of Hanover, New Hampshire, were married recently.

Deaths

Dr. John B. Leffingwell, Bradenton, aged 76, died November 19.

Dr. Lyston H. D. Pierce, St. Petersburg, aged 69, died November 4.

Dr. Anne H. McFarland Sharpe, Tallahassee, aged 62, died December 13 of pneumonia.

Dr. La Forest Almond Shattuck, Leesburg, aged 84, died July 6, in Ocala, of heart disease.

GEORGIA

The Southeastern Surgical Congress has announced that its second annual assembly will be held at the Biltmore Hotel, Atlanta, March 9-10.

The Medical Association of Georgia will hold its eighty-second annual meeting at the Biltmore Hotel, Atlanta, May 12-15.

As a gift of Joseph Brown Whitehead, Jr., in memory of his father, the Emory University School of Medicine is to have a new laboratory and a fellowship to be known as the Joseph Brown Whitehead Laboratory of Surgical Research and the Joseph Brown Whitehead Fellowship in Surgical Research.

A $500,000 endowment campaign has been announced by Governor Franklin D. Roosevelt, of New York, for the Warm Springs Foundation, Warm Springs, an institution for the treatment of infantile paralysis, the purpose of the endowment to extend treatment given at the institution to a larger number of afflicted persons.

Dr. Fletcher H. Brooks, Baltimore, Maryland, Surgeon Lieutenant Commander, Medical Corps, U. S. Navy, retired, has been appointed Director of the John D. Archbold Memorial Hospital at Thomasville, to succeed Col. James L. Bevans, resigned. Dr. Brooks will assume his new duties on April 1.

Grady Hospital and Steiner Clinic, Atlanta, since January 1, have been under the management of a Board of Trustees, consisting of five private citizens, Chairman of the Hospital Committee of the Council and the Mayor.

Dr. A. C. Shamblin, formerly of Rome, has been elected Commissioner of Health of Bartow County and is now located at Cartersville.

Dr. John W. Mobley, Jr., formerly of Milledgeville, has moved to Pelham for the practice of medicnie.

Deaths

Dr. William J. Brown, Rome, aged 72, died October 31.

Dr. John E. Toole, Bainbridge, aged 62, died in November.

Dr. John A. Dunwoody, Brunswick, aged 66, died November 27 of pneumonia.

Dr. Isaiah T. Epps, La Grange, aged 62, died October 30.

(Continued on page 34)

ANNOUNCEMENT

The Southeastern Surgical Congress

Announces the Second Annual Assembly of the Congress, which will be held in ATLANTA, Georgia, at the Biltmore Hotel, March 9-10, 1931

The following distinguished guests will appear on the program:

BABCOCK, DR. WM. WAYNE, Philadelphia, Pa.—"Vaginal Hysterectomy."

BALFOUR, DR. DONALD C., Rochester, Minn.—"Present Status of the Management of Peptic Ulcer."

BARKER, DR. LEWELLYS F., Baltimore, Md.—Banquet Speaker—"The Necessity for Close Relationship Between the Modern Internist and the Up-to-Date Surgeon."

BARNHILL, DR. JOHN F., Miami Beach, Fla., and Indianapolis, Indiana.—"Focal Infection and Its Relation to General Systemic Disease."

BLAIR, DR. VILRAY PAPIN, St. Louis, Mo.—"Paper on Plastic Surgery."

CAMPBELL, DR. WILLIS C., Memphis, Tenn.—"Ununited Fractures."

COFFEY, DR. ROBERT C., Portland, Oregon.—"Transplantation of Ureters Into the Large Bowel When Necessary to Eliminate the Bladder as a Reservoir for Urine."

CRILE, DR. GEORGE W., Cleveland, Ohio.—"The Kinetic System and its Control."

DEAVER, DR. JOHN B., Philadelphia, Pa.—"Diagnosis and Management of Acute Abdominal Conditions."

DOWMAN, DR. CHARLES E., Atlanta, Ga.—"Diagnosis and Management of Brain Injuries."

DuBOSE, DR. F. G., Selma, Ala.—Banquet Speaker—"Observation on Diagnostic and Therapeutic Paravertebral Block."

ERDMAN, DR. JOHN F., New York, N. Y.—"Tumors of the Colon."

GUERRY, DR. LeGRAND, Columbia, S. C.—"Effect of Pregnancy on a Case of Post-Operative Para-Thyroid Tetany."

HAGGARD, DR. WILLIAM D., Nashville, Tenn.—Subject to appear later.

HOKE, DR. MICHAEL, Atlanta, Ga.—"Fractures—Some Methods of Treatment."

HORSLEY, DR. J. SHELTON, Richmond, Va.—"Diagnosis and Management of Peptic Ulcer."

JACKSON, DR. CHEVALIER, Philadelphia, Pa.—"Diagnostic Bronchoscopy."

KILLIAN, DR. JOHN A., New York, N. Y.—"The Value of Collaboration of the Biochemist With the Surgeon."

LAHEY, DR. FRANK H., Boston, Mass.—"Diagnosis and Management of Thyroid Pathology."

LILIENTHAL, DR. HOWARD, New York, N. Y.—"Diagnosis and Treatment of Common Chest Conditions."

McCARTHY, DR. JOSEPH F., New York, N. Y.—"Address on Urology."

MOORE, DR. JOHN T., Houston, Texas.—"The Fourth Epoch in Treatment of Cancer of the Breast."

MOORHEAD, DR. JOHN J., New York, N. Y.—"The Surgical Knee."

ROYSTER, DR. HUBERT A., Raleigh N. C.—"Address on the Appendix."

SHANDS, DR. H. R., Jackson, Miss.—"The Wright Method of Treating Leg Ulcers."

THORNTON, DR. LAWSON, Atlanta, Ga.—"See Dr. Hoke's Subject."

YOUNG, DR. HUGH H., Baltimore, Md.—"Differential Diagnosis and Management of the Senile Prostate."

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(Page 53, "Useful Cathartics")

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(Page 55, "Useful Cathartics")

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(Continued from page 180)

Dr. William Jackson Smith, DeSoto, aged 65, died November 8.

Dr. Blair Dabney Taylor, Atlanta, aged 82, died October 29.

KENTUCKY

The Southern Surgical Association held its annual meeting at Lexington in December under the presidency of Dr. James M. Mason, Birmingham, Alabama. The newly elected officers are Dr. Hugh H. Trout, Roanoke, Virginia, President; Dr. Frank C. Beall, Fort Worth, Texas, and Dr. Charles A. Vance, Lexington, Vice-Presidents; Dr. R. L. Payne, Norfolk, Virginia, Secretary, reelected; and Dr. Julius Taylor, Columbia, South Carolina, Treasurer. White Sulphur Springs, West Virginia, was selected for the next meeting place which will be December 8-10, 1931.

Union County Medical Society has elected Dr. C. B. Graves, Morganfield, President; Dr. G. B. Carr, Sturgis, Vice-President; Dr. D. C. Donan, Morganfield, Secretary.

A whole time health unit for Barren County was to have begun functioning January 1, when assured by the fiscal court to allow $1,250 toward its support. The remainder of the annual cost, estimated at $10,000, was guaranteed by the Commonwealth Fund and the State of Kentucky.

Emma Dale Booth, formerly Superintendent of Emma Booth Memorial Hospital, Covington, and also for a few years Superintendent of the Boston Hospital, Rockbury, Massachusetts, has been appointed supervisor of all the women's social homes and hospitals of the Salvation Army in the Southern territory, with headquarters in Atlanta, Georgia.

Deaths

Dr. William Thomas Amyx, Lexington, aged 63, died November 15.

Dr. Frances Monroe Jackson, Dawson Springs, aged 60, died December 12 of nephritis.

Dr. William Dallas Richards, Dayton, aged 80, died November 13.

Dr. Anna E. Wolfram, Bellevue, aged 73, died December 2 of pulmonary tuberculosis.

LOUISIANA

Dr. Homer Dupuy, New Orleans, has been reappointed the member of the Council from Louisiana of the Southern Medical Association, the appointment having been announced recently by the President, Dr. Felix J. Underwood, Jackson, Miss.

The Orleans Parish Medical Society has elected Dr. Emmett L. Irwin, President; Dr. E. L. King, First Vice-President; Dr. Louis Levy, Second Vice-President; Dr. Waldemar R. Metz, Third Vice-President; Dr. H. Theodore Simon, Secretary; Dr. John A. Lanford, Treasurer; Dr. Daniel N. Silverman, Librarian; and Dr. C. Greenes Cole, Dr. W. P. Gardiner, and Dr. J. D. Rives, members of the Board of Directors. An oil painting of the late Dr. Charles Turpin, first president of the Orleans Parish Medical Society, was presented by Dr. A. E. Fossier. It with other pictures of the founders and former presidents will be hung in the Directors' rooms at the society headquarters in the new Tulane Medical School Building.

Louisiana State University will have a college of medicine with the opening of the 1931 school year, according to an announcement by Governor Huey P. Long, ex-officio President of the Board of Trustees. Students will be required to spend four years at the University in Baton Rouge, inclusive of their premedical training for two years. The final two years in the medical college will be spent in New Orleans obtaining practical training in classes to be offered in connection with the Charity Hospital.

According to announcement of the Superintendent, Dr. Arthur Vidrine, two short special training courses have been planned for the Charity Hospital, New Orleans, one for teachers of nurses and another for country physicians. No tuition will be charged for the courses.

The new Hutchinson Memorial Building of the School of Medicine of Tulane University, New Or-

(Continued on page 36)

Announcing a Series of Radio Talks..."Devils, Drugs and Doctors"...by Howard W. Haggard, M.D., Assoc. Prof. of Physiology, Yale University

EVERY member of the profession knows there are intensely dramatic spots in medical history, both past and in the making. Yet it is not often that such of this material as interests the layman is of enough scientific import to command the respect of the profession.

Now, however, a real attempt is being made to acquaint the public with some of the high points in medical history and with recent advances in the science of health preservation.

On Sunday evening, January 25, Howard W. Haggard, M. D., Associate Professor of Physiology at Yale, widely known as the author of "Devils, Drugs, and Doctors," commenced a series of weekly radio programs as interesting as his book and as authentic as his academic standing. These programs are being broadcast over a coast-to-coast network of the Columbia System.

8:00-8:15 P. M. (E.S.T.)

Akron	WADC
Baltimore	WCAO
Boston	WNAC
Buffalo	WGR
Cincinnati	WKRC
Cleveland	WHK
Detroit	WXYZ
Hartford	WDRC
New York City	WABC
Philadelphia	WCAU
Pittsburgh	WJAS
Providence	WEAN
Rochester	WHEC
Syracuse	WFBL
Toledo	WSPD
Washington	WMAL

*Beginning March 8th

7:00-7:15 P. M. (C.S.T.)

Atlanta	WGST
Birmingham	WBRC
Chicago	WMAQ
Dallas	WRR
Fort Wayne	WOWO
Indianapolis	WFBM
Kansas City	KMBC
Memphis	WREC
Milwaukee	WISN
*Minneapolis	WCCO
Nashville	WLAC
New Orleans	WDSU
Omaha	KOIL
St. Louis	KMOX
San Antonio	KTSA
Sioux City	KSCJ
Topeka	WIBW

6:00-6:15 P. M. (M.S.T.)

Denver	KLZ
Salt Lake City	KDYL

5:00-5:15 P. M. (P.S.T.)

Los Angeles	KHJ
Portland	KOIN
San Francisco	KFRC
Seattle	KOL
Spokane	KFPY
Tacoma	KVI

The stations listed have been secured to broadcast the early programs of this series. Since the talks will continue through 1931, it may be possible to add other stations to the coast-to-coast network.

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During the past fifteen years, the author has been repeatedly asked to refer physicians and surgeons to some textbook in which they could find an adequate discussion of the diagnostic questions that constantly present themselves when studying suspected cases of brain tumor. These repeated inquiries have made him realize that none of the standard textbooks on neurology deal with the subject of brain tumors as completely as the subject deserves. The angle from which Dr. Sachs treats this subject differs also from that usually found in textbooks of neurology or in textbooks of surgery—it is from the point of view of the neurological surgeon.

Table of Contents

I. Surgical Anatomy and Physiology.
II. Methods of Examination.
III. The Surgical Pathology of Brain Tumors.
IV. General Symptoms and Signs of Increased Intracranial Pressure.
V. Cerebral Tumors, Focal Signs and Symptoms.
VI. Tumors of Cerebellum, Pons and Medulla.
VII. Diseases of the Pituitary Gland.
VIII. Differential Diagnosis Between Brain Tumors and Other Conditions.
IX. Operative Technic and Post Operative Treatment.

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(Sou. Med. Jr.)

(Continued from page 34)

leans, was formally opened on December 10, this to be devoted to the care of the ambulatory sick and the injured, and at the same time to be used for instruction of medical students. Each student will be given his own office, resembling private practice. The new building was made possible by a contribution of $1,250,000 from the General Educational Board of the Rockefeller Foundation.

Ascension Parish Medical Society has elected Dr. H. A. Folse, Donaldsonville, President; Dr. C. D. Simmons, Prairieville, Vice-President; and Dr. D. C. Brumfield, Darrow, Secretary-Treasurer.

Bienville Parish Medical Society has elected Dr. R. C. Ferguson, Arcadia, President; Dr. J. M. Moseley, Arcadia, Vice-President; Dr. J. N. Blume, Arcadia, Secretary-Treasurer.

East Baton Rouge Parish Medical Society has elected Dr. Rufus Jackson, Baton Rouge, President; Dr. T. C. Foreman, Baton Rouge, Vice-President; Dr. W. H. Pipes, Baton Rouge, Secretary-Treasurer.

East and West Feliciana Bi-Parish Medical Society has elected Dr. J. B. Sewell, St. Francisville, President; Dr. S. L. Shaw, Clinton, Vice-President; Dr. E. M. Toler, Clinton, Secretary-Treasurer.

Jackson-Lincoln Bi-Parish Medical Society has elected Dr. J. J. Bennett, Ruston, President; Dr. D. S. Calhoun, Ruston, Vice-President from Lincoln Parish; Dr. W. M. McBride, Hodge, Vice-President from Jackson Parish; Dr. W. S. Rutledge, Ruston, Secretary-Treasurer.

Pointee-Coupee Parish Medical Society has elected Dr. Jos. O. St. Dizier, Walls, President; Dr. J. F. Cazayoux, New Roads, Vice-President; Dr. F. F. Rougon, New Roads, Secretary-Treasurer.

Rapides Parish Medical Society has elected Dr. G. C. Antony, Alexandria, President; Dr. D. K. Texada, Alexandria, Vice-President; Dr. W. L. Murrell, Alexandria, Second Vice-President; Dr. E. Weiner, Alexandria, Secretary-Treasurer.

Shreveport Medical Society has elected Dr. Pope W. Oden, Shreveport, President; Dr. J. R. Stamper, Shreveport, First Vice-President; Dr. O. A. Eaddy, Keithville, Second Vice-President; Dr. W. B. Heidorn, Shreveport, Secretary; and Dr. J. E. Knighton, Jr., Shreveport, Treasurer.

Washington Parish Medical Society has elected Dr. D. A. Berwick, Bogalusa, President; Dr. H. V. Jones, Bogalusa, Vice-President; Dr. Frank A. Williams, Franklinton, Secretary-Treasurer.

Webster Parish Medical Society has elected Dr. C. T. Deloach, Sarpeta, President; Dr. S. M. Richardson, Minden, Vice-President; Dr. W. McDade, Minden, Secretary-Treasurer.

Dr. Whyte Glendower Owen, White Castle, was given a banquet on December 2, by the Iberville Parish Medical Society, in celebration of his completion of fifty years in the practice of medicine.

Among the five hundred candidates submitting histories and case reports to be acted upon by the Committee on Membership of the American College of Surgeons, those sent in by Dr. J. T. Nix, New Orleans, were most complete, and in recognition of this the College awarded to him a life membership.

Dr. Edwin S. Freeman has assumed his duties as Health Director of the Madison Parish Health Department, with headquarters in Tallulah.

Dr. Walter C. Coney, Jonesville, has been appointed Director of the Catahoula Parish Health Unit.

Dr. Charles Chassaignac, who has been Superintendent of the Eye, Ear, Nose and Throat Hospital, New Orleans, for more than eight years, has resigned.

Deaths

Dr. Oscar Dowling, Shreveport and New Orleans, aged 64, died January 3.

Dr. Peter R. Bacot, Vernado, aged 65, died November 14.

Dr. Charles Francis Duchein, Baton Rouge, aged 55, died October 28 of pneumonia.

MARYLAND

Dr. Edward A. Looper, Baltimore, has been appointed the member of the Council from Maryland of the Southern Medical Association, the appointment having been announced recently by the President, Dr. Felix J. Underwood, Jackson, Miss. Dr. Looper

(Continued on page 38)

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(Continued from page 36)

succeeds Dr. Sidney R. Miller, Baltimore, whose term had expired, and having served the constitutional limit, was not eligible to reappointment.

A Department of Oncology, a subdepartment of Surgery, has been opened at the University of Maryland Hospital, Baltimore. The work of the department has been divided into two groups: one for the treatment of gynecologic conditions and the other for the treatment of general surgical problems. Dr. John Mason Hundley, Jr., is in charge of the gynecologic section and Dr. Grant E. Ward the general surgical group. Both private and nonpaying patients will be received.

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The following De Lamar lectures will be given on dates indicated at the School of Hygiene and Public Health of Johns Hopkins University, Baltimore: Dr. Thomas Parran, Jr., Commisioner of Health, State of New York, March 3, "Venereal Diseases;" Dr. William B. Wherry, Professor of Bacteriology and Hygiene, University of Cincinnati College of Medicine, March 31, "Hypersensitivity to Bacterial Proteins and Its Role in Susceptibility and Immunity;" and Dr. George F. McCleary, Deputy Senior Medical Officer, Ministry of Health, England, April 14, "The Prevention and Cure of Narcotic Drug Addiction."

Deaths

Dr. Robert Martin Culler, Oxford, aged 53, died August 4.

Dr. Henry J. Hahn, Jr., Baltimore, died suddenly December 5 of heart disease.

Dr. Henry S. Herman, Hagerstown, aged 80, died November 14.

Dr. Oliver Edward Janney, Baltimore, aged 74, died November 17 of pneumonia.

Dr. Jacob Fletcher Somers, Crisfield, aged 71, died in October of chronic myocarditis and acute dilatation of the heart.

Dr. Samuel Theobald, Baltimore, aged 84, died December 20 of senility.

MISSISSIPPI

The Northeast Mississippi Thirteen County Medical Society held its regular quarterly meeting at Aberdeen in mid-December. In honor of Dr. Felix J. Underwood, State Health Officer, the newly elected President of the Southern Medical Association, the meeting was designated "Underwood Day", this being Dr. Underwood's home county and home society. Following a splendid scientific program in the afternoon there was a banquet at the Parkway Hotel in the evening with brief speeches by Dr. Underwood and others. Dr. J. M. Acker, Jr., Aberdeen, Secretary of the Society, presided, and was toastmaster.

Dr. Inman W. Cooper, Meridian, has been reappointed the member of the Council from Mississippi of the Southern Medical Association, the appointment having been announced recently by the President, Dr. Felix J. Underwood, Jackson.

South Mississippi Medical Society has elected Dr. W. S. Harper, Laurel, President; Dr. W. N. Blount, Laurel, First Vice-President; Dr. Lowery, Hattiesburg, Second Vice-President; Dr. J. H. Newcomb, Richton, Secretary-Treasurer, reelected.

Clarksdale and Six Counties Medical Society has elected Dr. W. S. Slaughter, Jonestown, President; Dr. A. W. Rhyne, Coahoma, Vice-President from Coahoma County; Dr. H. L. Cockerham, Gunnison, Vice-President from Bolivar County; Dr. J. G. Backstrom, Tutwiler, Vice-President from Tallahatchie County; Dr. H. L. Williams, Tunica, Vice-President from Tunica County; Dr. J. D. House, Sledge, Vice-President from Quitman County; Dr. D. V. Galloway, Clarksdale, Secretary-Treasurer, reelected.

Issaquena-Sharkey-Warren Counties Medical Society has elected Dr. J. B. Benton, Valley Park, President; Dr. T. W. Huey, Grace, Vice-President from Issaquena County; Dr. H. S. Goodman, Cary, Vice-President from Sharkey County; Dr. F. M. Smith, Vicksburg, Vice-President from Warren County; Dr. L. S. Lippincott, Vicksburg, Secretary-Treasurer.

At the regular meeting of the Staff of the Vicksburg Sanitarium held in December Dr. G. C. Jarratt was elected President; Dr. L. J. Clark, Vice-President; and Dr. L. S. Lippincott, Secretary.

It is reported that Pike County has been assured a model Health Unit by the Board of Supervisors appropriating sufficient funds to match the State Board of Health and town appropriations. This unit has been brought about through the consideration of Dr. Felix J. Underwood, who was influenced largely by a $2,500 appropriation from Mr. Bradshaw, a former citizen of Summit.

There has been added to the McComb City Hospital, a modern laboratory and solarium, with Miss Margaret Ann Supple of the University of Minnesota as technician and physiotherapist.

A free Medical and Surgical Clinic has been opened at the Crawford Clinic and South Mississippi Infirmary, Hattiesburg, as an aid to the unemployed dur-

(Continued on page 40)

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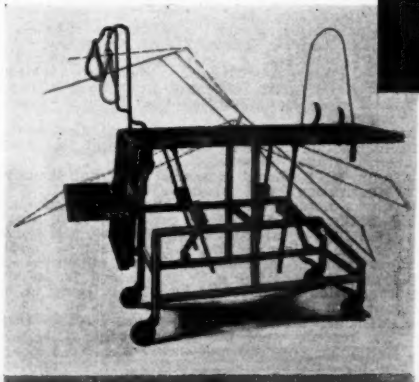

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(Continued from page 38)

ing the emergency period. Mr. W. Hamilton Crawford, Superintendent, is in charge of the Clinic.

Arrangements were made by the officials of the Rockefeller Foundation for Dr. Ph. Copanaris, Director of Hygiene for Greece, to visit Mississippi in mid-January. He stopped at the Indianola Training Station for Health Workers en route to Jackson, where he discussed Mississippi's rural health administration with particular reference to malaria control.

At a meeting of the staff of the Baptist Hospital, Jackson, Dr. R. C. O'Ferrall and Dr. W. L. Hughes were elected to the staff and the name of Dr. L. B. Moseley was proposed for membership.

Dr. Ellis Columbus Moore, Carthage, and Miss Catherine Preston Finney, Lexington, Virginia, were married recently.

Deaths

Dr. John A. Barnes, Louise, aged 70, died November 20.

Dr. Franklin Pierce Boatner, Potts Camp, aged 78, died December 20 in a hospital in New Albany.

Dr. Henry Spencer Capps, Hazlehurst, aged 56, died suddenly December 1 in Macon, Georgia, of cerebral hemorrhage.

Dr. I. A. Shelby, Columbia, aged 58, died December 10.

MISSOURI

Cole County Medical Society has elected Dr. H. I. Taylor, Jefferson City, President; Dr. Ross Hopkins, Jefferson City, Vice-President; Dr. James A. Hill, Jefferson City, Secretary-Treasurer.

Greene County Medical Society has elected Dr. Otto C. Horst, Springfield, President; Dr. Urban J. Busiek, Springfield, Vice-President; Dr. J. Newton Wakeman, Springfield, Secretary, reelected; Dr. Walter E. Handley, Springfield, Treasurer, reelected.

Nodaway County Medical Society has elected Dr. K. C. Cummins, Maryville, President; Dr. Chas. W. Kirk, Hopkins, Vice-President; Dr. Chas D. Humberd, Barnard, Secretary-Treasurer.

Randolph-Monroe County Medical Society has elected Dr. D. A. Barnhart, Huntsville, President; Dr. O. K. Megee, Moberly, Vice-President; Dr. Thomas S. Fleming, Moberly, Secretary-Treasurer, reelected.

Marion County Medical Society has elected Dr. C. W. Hamlin, Palmyra, President; Dr. E. R. Motley, Hannibal, Vice-President; Dr. F. E. Sultzman, Hannibal, Secretary-Treasurer.

Southeast Missouri Medical Association has elected Dr. J. Lee Harwell, Poplar Bluff, President; Dr. David E. Smith, Bonne Terre, Vice-President; Dr. W. S. Love, Charleston, Recording Secretary, reelected; Dr. E. J. Nienstedt, Blodgett, Corresponding Secretary, reelected; Dr. Paul Baldwin, Kennett, Treasurer, reelected.

Vernon-Cedar County Medical Society has elected Dr. E. H. Liston, Nevada, President; and Dr. J. T. Hornback, Nevada, Secretary.

The John H. Bothwell Memorial Hospital, Sedalia, a city institution, was opened November 1. This hospital was made possible by the gift of the late John H. Bothwell of $100,000 in cash, $50,000 in stock, and a trust fund of approximately $150,000, and bonds voted by the citizens. The management is under the supervision of a Hospital Board appointed by the Mayor. Cooperating with the Board is an advisory committee composed of Drs. F. B. Long, A. L. Walter, and M. P. Shy, of Sedalia.

The Missouri Methodist and Noyes-Baptist Hospitals, St. Joseph, were merged recently. The Missouri Methodist Hospital purchased the Noyes-Baptist Hospital building and converted the Noyes-Baptist Hospital into a nurses' home. The consolidated institution will retain the name of the Missouri Methodist Hospital.

The name of the Jewish Memorial Hospital under construction at Kansas City has been changed to Menorah Hospital for the reason that the hospital will be nonsectarian. The hospital is about half completed and will cost approximately $1,000,000. It will be ready for occupancy about June.

At the next meeting of the Legislature an appropriation of $100,000 will be asked for a tuberculosis and contagious disease ward at State Hospital No. 2, St. Joseph.

(Continued on page 42)

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Recently the cornerstone of the new Independence Hospital, at Independence, was laid. This is a six-story structure to be run under the auspices of the Reorganized Church of Jesus Christ of Latter Day Saints and will be managed by a board composed of church and public officials. It is being built at a cost of $250,000, the community having raised $137,000, and the remainder being given by the church.

Dr. Mazyck P. Ravenel, Columbia, Professor of Preventive Medicine and Bacteriology at the University of Missouri, has been appointed Consultant in Public Health and Medical Education to the Missouri State Board of Health.

Deaths

Dr. Louis Phillip Barnett, St. Louis, aged 29, died December 2.

Dr. George Washington Heuman, St. Louis, aged 48, died in December.

Dr. Benjamin Jacobs, Kansas City, aged 65, died December 11 in Rochester, Minnesota, following an operation.

Dr. Winn Fort Morrow, Kansas City, aged 76, died November 29 of cerebral hemorrhage.

Dr. Leslie Brown Miller, Kansas City, aged 46, died December 5 of heart disease.

NORTH CAROLINA

The Seaboard Medical Association of Virginia and North Carolina held its annual meeting at Elizabeth City December 2-4. The newly elected officers are Dr. James H. Culpepper, Norfolk, Virginia, President; Drs. C. B. Williams, Elizabeth City, James E. Marable, Newport News, Virginia, Paul H. Whitaker, Kinston, O. R. Yates, Suffolk, Virginia, Vice-Presidents; Dr. A. M. Burfoot, Fentress, Virginia, Treasurer, reelected; Dr. Clarence Porter Jones, Newport News, Virginia, Secretary, reelected. Newport News, Virginia, was chosen as the next meeting place, December 1-3, 1931.

Under the auspices of the American Society for the Control of Cancer, free cancer examination clinics were held recently at the Goldsboro Hospital, being conducted by Dr. Henry B. Ivey, Goldsboro, and physicians of Wayne County.

The Chatham Memorial Hospital, Elkin, which was made possible through the Duke Foundation, citizens of Elkin and members of the family of the late H. G. Chatham, will open in February or March. Dr. Vernon C. Lassiter, Winston-Salem, the Superintendent, will assume charge of the institution at that time.

Deaths

Dr. Charles P. Bolles, Wilmington, aged 56, was accidentally asphyxiated November 28.

Dr. Harold Hartley Cauble, Kannapolis, aged 46, died November 20 at Salisbury of heart disease.

Dr. William Ernest Evans, Rowland, aged 61, died December 11 in a hospital at Florence, South Carolina, of injuries received when the automobile in which he was driving was struck by a train.

Dr. William H. Ward, Plymouth, aged 73, died November 9 of angina pectoris.

OKLAHOMA

Dr. Lea A. Riely, Oklahoma City, has been reappointed the member of the Council from Oklahoma of the Southern Medical Association, the appointment having been announced recently by the President, Dr. Felix J. Underwood, Jackson, Miss.

Atoka County Medical Society has elected Dr. J. S. Fulton, President, and Dr. C. C. Gardner, Secretary, both of Atoka.

Bryan County Medical Society has elected Dr. John T. Wharton, Durant, President; Dr. B. B. Coker, Durant, Vice-President; Dr. Jas. L. Shuler, Durant, Secretary.

Creek County Medical Society has elected Dr. C. L. McCallum, Sapulpa, President; Dr. John Wells, Bristow, Vice-President; Dr. G. C. Croston, Sapulpa, Secretary-Treasurer.

Greer County Medical Society has elected Dr. J. T. Lowe, Mangum, President; Dr. G. W. Austin, Man-

(Continued on page 44)

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Write for fees and directions.

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St. Louis, Mo.

(Continued from page 42)

gum, Vice-President; Dr. J. B. Hollis, Mangum, Secretary, reelected.

Garvin County Medical Society has elected Dr. L. P. Smith, Elmore City, President; Dr. Ray Lindsey, Pauls Valley, Vice-President; Dr. J. R. Callaway, Secretary, reelected.

Garfield Medical Society has elected Dr. S. H. McEvoy, President; Dr. C. W. Tedrowe, Vice-President; Dr. John R. Walker, Secretary-Treasurer, reelected, all of Enid.

Jackson County Medical Society has elected Dr. E. S. Crow, Olustee, President, reelected; Dr. J. B. Hix, Altus, Vice-President; Dr. E. W. Mabry, Altus, Secretary and Treasurer, reelected.

Lincoln County Medical Society has elected Dr. J. S. Rollins, Prague, President; Dr. W. D. Baird, Stroud, Vice-President; Dr. F. H. Norwood, Prague, Secretary-Treasurer.

Latimer County Medical Society has elected Dr. T. L. Henry, President, and Dr. E. B. Hamilton, Secretary, both of Wilburton.

Marshall County Medical Society has elected Dr. P. F. Robinson, Meadill, President; Dr. W. D. Haynie, Kingston, Vice-President; Dr. J. H. Veazy, Madill, Secretary.

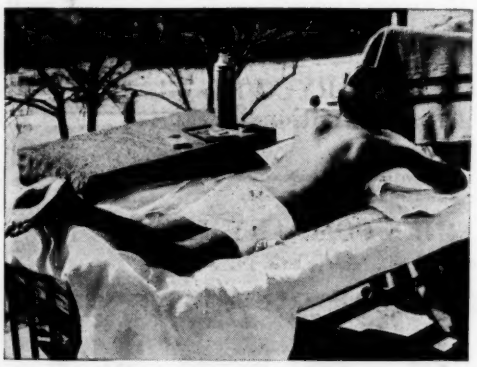
Muskogee County Medical Society has elected Dr. Wm. Pat Fite, Muskogee, President; Dr. A. L. Stocks, retiring President, as President Emeritus; Dr. L. C. McAllister, Vice-President; Dr. E. H. Coachman, Secretary, all of Muskogee.

McCurtain County Medical Society has elected Dr. R. D. Williams, Idabel, President; Dr. J. T. Moreland, Idabel, Vice-President; Dr. R. T. Sherrill, Broken Bow, Secretary.

The Mark Finston Fund so far as is known is the first research fund established in the State of Oklahoma. Mr. Mark Finston, Tulsa oil man, established this fund for use in St. John's Hospital, Tulsa, for research work in hematology.

Dr. J. N. Cross, Cheyenne, is now taking postgraduate work at the Tulane University, New Orleans, Louisiana.

(Continued on page 46)



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CONSERVATIVE HYGIENIC TREATMENT of the early lesion is still our most effective and decisive weapon against tuberculosis. Your patient whom we put in bed, in the dry open air, with daily sunshine gets that CONSERVATIVE HYGIENE—gets it consistently—gets it without the adverses incident to exposure.

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Patient Types . . .

The Business Man

The busy business man, who gives least care to his most valuable asset — his health.

Doing everything at high tension, he wants you to cure his disorders on a factory production basis.

Strong talk and definite instructions are necessary to make him realize the importance to his health of bowel education.

In addition to the regulation of habits of diet and exercise, the use of Petrolagar will materially shorten the period of bowel re-education.

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Gentlemen:—Send me copy of the new brochure "HABIT TIME" (of bowel movement) and specimens of Petrolagar.

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MANHATTAN EYE SALVE COMPANY

Louisville, Kentucky

(Continued from page 44)

Dr. E. S. Ferguson, Oklahoma City, spent several days in Cuba recently.

Dr. Henry H. Turner, Oklahoma City, has returned from a three months' post-graduate study in Neurology in Vienna and London.

Miss Mary Sauter, R. N., is the new head of Broken Bow Hospital at Broken Bow.

Dr. Leroy Goodman and Miss Marie Mulvey, both of Yukon, were married November 9.

Deaths

Dr. Joseph Louis Barker, Oklahoma City, aged 53, died December 4 of cerebral hemorrhage.

Dr. Joseph A. Patton, Stilwell, aged 62, died December 5.

SOUTH CAROLINA

The next annual meeting of the South Carolina Medical Association will be held in Greenville, May 5-7. The House of Delegates will meet on Tuesday night, May 5. The South Carolina Urological Society will have a symposium on May 7.

Greenville County Medical Society has elected Dr. I. S. Barksdale, Greenville, President; Dr. W. S. Fewell, Greenville, Vice-President; Dr. Hugh Smith, Greenville, Treasurer; Dr. Jack D. Parker, Greenville, Secretary.

Dr. Joseph Henry Cutchin, Easley, and Miss Frances Blackman, Spartanburg, were married November 5.

TENNESSEE

The Tri-States Medical Association of Mississippi, Arkansas, and Tennessee, will hold its next annual convention at the Hotel Peabody, Memphis, February 17-20.

Anderson County Medical Society has elected Dr. W. L. Carden, Andersonville, President; Dr. J. Sam Taylor, Clinton, Vice-President; Dr. J. S. Hall, Clinton, Secretary-Treasurer.

(Continued on page 48)

Remember! When Treating Stubborn Coughs

COMPOUND SYRUP OF CALCREOSE is a tasty, effective cough syrup that does not nauseate.

Each fluid ounce represents Calcreose Solution, 160 mins.; Alcohol, 24 mins.; Chloroform, approximately 3 mins.; Wild Cherry Bark, 20 grs.; Aromatics and Syrup, q. s.

TABLETS CALCREOSE 4 GRS. provide the full expectorant action of creosote in a form which patients tolerate.

Each tablet is equivalent to 2 grains of creosote combined with hydrated calcium oxide.

Doctor—Check your choice of offers and return the lower corner with anything showing your name and address.

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—far-fetched and foolish though it may seem to you —causes very *real* anguish to many of your patients. Children and nervous women especially may gag and positively suffer at the mere thought of a whole spoonful of unpleasant Cod Liver Oil.

Your prescription for White's Cod Liver Oil Concentrate is a revelation to these patients—

Just three little wafers—as good as candy—so that for children medicine-time becomes a treat.

And *you* can rely on their taking White's; getting the full Vitamin A and D potency of high-test oil regularly.

Nervousness and wayward irritability in children is often a definite indication for Cod Liver Oil. When you prescribe White's Cod Liver Oil Concentrate you assure the patient of no less than 250 units Vitamin A and 100 units Vitamin D in *each wafer*.

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Cod Liver Oil Concentrate

HEALTH PRODUCTS CORPORATION

NEWARK, NEW JERSEY

O-5

(Continued from page 46)

Bedford County Medical Society has elected Dr. T. H. Woods, Bell Buckle, President; Dr. T. J. Coble, Shelbyville, Vice-President; Dr. W. H. Avery, Shelbyville, Secretary.

Benton, Carroll, Henry, Weakley Counties Medical Society has elected Dr. E. M. Alexander, McKenzie, Carroll County, President; Dr. J. E. Jeter, Gleason, Weakley County, Vice-President; Dr. S. W. Huffman, Carroll County, Vice-President; Dr. Chas. Hendley, Paris, Henry County, Vice-President; Dr. A. T. Perry, Camden, Benton County, Vice-President; Dr. Geo. D. Boone, Jr., Paris, Henry County, Secretary-Treasurer.

Blount County Medical Society has elected Dr. E. H. Lowe, Maryville, President; Dr. D. R. Thomas, Calderwood, Vice-President; Dr. J. A. McCulloch, Maryville, Secretary-Treasurer.

Campbell County Medical Society has elected Dr. L. M. Scott, Jellico, President; Dr. G. W. Presley, Lafollette, Vice-President; Dr. F. A. McClintock, Newcomb, Secretary.

Carter County Medical Society has elected Dr. Paul S. Williams, Elizabethton, President; Dr. Murrell Pinson, Elizabethton, Vice-President; Dr. E. T. Pearson, Elizabethton, Secretary-Treasurer.

Cocke County Medical Society has elected Dr. J. A. P. Shields, Hartford, President; Dr. M. S. Doak, Newport, Vice-President; Dr. J. E. Hampton, Newport Secretary.

Coffee County Medical Society has elected Dr. E. P. Vaughan, Manchester, President; Dr. U. B. Bowden, Pelham, Vice-President; Dr. C. E. Evans, Tullahoma, Secretary.

Dyer, Lake, Crockett County Medical Society has elected Dr. E. S. Hopper, Alamo, President; Dr. J. W. Wynn, Newbern, Vice-President, Dyer County; Dr. W. L. Sumners, Ridgely, Vice-President, Lake County; Dr. E. H. Baird, Dyersburg, Secretary.

Giles County Medical Society has elected Dr. F. C. Gaines, Pulaski, President; Dr. F. B. Hulme, Pulaski, Vice-President; Dr. T. F. Booth, Pulaski, Secretary; Dr. G. D. Butler, Pulaski, Treasurer.

Hamilton County Medical Society has elected Dr. John B. Haskins, Chattanooga, President; Dr. B. L. Jacobs, Chattanooga, Vice-President; Dr. S. F. McIntosh, Chattanooga, Secretary-Treasurer.

Hardin, Lawrence, Lewis, Perry and Wayne Counties Medical Society has elected Dr. O. A. Kirk, Linden, President; and Dr. C. C. Stockard, Lawrenceburg, Secretary and Treasurer.

Haywood County Medical Society has elected Dr. G. G. Mulherin, Brownsville, President; Dr. Wm. Nash, Stanton, Vice-President; Dr. J. L. Edwards, Brownsville, Secretary.

Madison County Medical Society has elected Dr. W. B. Eason, Jackson, President; Dr. C. F. Webb, Jackson, Vice-President; Dr. B. C. Arnold, Jackson, Secretary-Treasurer.

Maury County Medical Society has elected Dr. J. S. Covey, Culleoka, President; Dr. W. E. Black, Columbia, Secretary-Treasurer.

Middle Tennessee Medical Society has elected Dr. J. H. Tilley, Lawrenceburg, President; Dr. C. S. McMurry, Nashville, Vice-President; Dr. Theodore Morford, Nashville, Secretary.

A portrait of Dr. James D. Plunket, first president of the Tennessee State Board of Health, was presented to the State Department of Public Health at the fourth annual Tennessee Health Workers' Conference in Nashville, December 18-20. This will be permanently preserved in the office of the Commissioner of Public Health as a memorial to Dr. Plunket.

The City Council of Knoxville voted an appropriation of $25,000 toward the cost of a Negro unit as an addition to the Knoxville General Hospital. The Julius Rosenwald Foundation contributed $50,000 and the remainder of the fund was contributed from local sources. Negro physicians, interns and nurses will comprise the staff of the unit in accordance with an agreement with the Rosenwald Foundation.

The United States Trachoma Hospital maintained at Knoxville by the U. S. Public Health Service since 1923 has been reported closed and the Medical Officer in charge, Dr. James Edward Smith, transferred to

(Continued on page 50)

VIM TONSIL SYRINGE No. 723-V

With Spool Top and Vim Lock

A perfectly balanced instrument for the specialist. And there is none handier for doing a tonsillectomy under "local."

The **Spool-Top** permits the syringe to be held in any position and affords "High Visibility."

Vim-Lock is a simple mechanical contrivance for locking a needle and syringe together.

We recommend Vim-Lock "tapered" tonsil needle of **Hardened Gold.** Ordinary Luer Needles may also be used.

Vim Tonsil Syringe, No. 723-V, 3 c.c. $6.50
Vim Tonsil Needle, Hardened Gold, Straight, No. 1330-1 ..... 3.00
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Clinical Results Clinch the Question of WEANING THE BABY

WHEN the breast-fed baby fails to gain at least three or four ounces a week, it is time to begin supplementary feedings with KLIM, which can be modified as to concentration to suit the individual baby.

KLIM... *the Powdered Whole Milk chosen by thousands of clinicians... meets the demands of weaning the well baby because*

KLIM is uniform in its constituents; free from all pathogenic bacteria. Its casein precipitates in finely divided floccules, and its smaller fat globules allow of a greater surface to be exposed to the action of the digestive juices of the stomach.

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OLEO-GOMENOL

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FOR SALE—The Meridian Sanitarium, Meridian, Miss. A fifty-bed hospital that is standardized, lately remodeled and is modern and up-to-date in every respect.

FOR SALE—X-ray, Lietz Binocular Microscope (250 mm), sterilizer, instruments, instrument glass cases, tables, typewriter and other medical apparatus. Will sell all or part. Address E. T. Grant, Grant Brothers, Plaquemine, La.

TECHNICIANS are in demand. We are successfully training laboratory and x-ray workers. Send us your assistant and we will return you a competent technician. If you are in immediate need of a well-trained helper, write or phone. Full information upon request. Alabama Pathological Laboratory, Birmingham General Hospital, Birmingham, Ala.

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(Continued from page 48)

the headquarters of the trachoma division of the Service at Rolla, Missouri.

Dr. Frederick E. Hasty, Nashville, announces he will confine his practice to otolaryngology.

Dr. William A. Garrott, formerly of Memphis, has opened offices at Chattanooga for the practice of diseases of the eye, ear, nose and throat.

Dr. I. A. McSwain, Paris, recently celebrated his eighty-fifth birthday.

Dr. Tom Rice, Friendship, celebrated his ninetieth birthday on December 6.

Dr. Sam T. Parker, Jackson, is taking special postgraduate work on the eye and ear at Harvard Medical College, Boston.

Deaths

Dr. Conley Mahlon Cowan, Bristol, aged 52, died October 30 of cerebral hemorrhage.

Dr. I. N. Ford, New Tazewell, aged 60, died November 17, following a brief illness of heart trouble.

Dr. Alberto Hudson, Nashville, aged 58, died suddenly December 11.

Dr. Eugene Chambers Kensinger, Athens, aged 44, died November 27 following an operation for appendicitis.

Dr. Roy Cleveland Long, Johnston City, aged 49, died October 1.

Dr. N. M. McCoin, Gainesboro, aged 72, died November 5 after an illness of several weeks.

Dr. Andrew Norris, Centerville, aged 92, died November 10 in Nashville.

Dr. Samuel W. Stone, Tazewell, aged 85, died November 26.

Dr. Henry A. Simpson, Afton, aged 69, died October 16.

Dr. Roscoe L. White, Memphis, aged 59, died December 2 of chronic interstitial nephritis.

Dr. Isaac Copeling Young, McEwen, aged 56, died November 21 at Duquoin, Illinois.

TEXAS

Bexar County Medical Society has elected Dr. Rex R. Ross, President; Dr. Dudley Jackson, Vice-President; Dr. H. O. Wyneken, Secretary; Dr. E. V. DePew, Treasurer, all of San Antonio.

Cameron County Medical Society has elected Dr. L. F. McClenathan, Harlingen, President; Dr. R. H. Eisaman, Brownsville, Vice-President; Dr. R. E. Utley, Harlingen, Secretary.

Coleman County Medical Society has elected Dr. W. L. Jennings, Coleman, President; Dr. Maurice Barnes, Coleman, Vice-President; Dr. E. D. McDonald, Santa Anna, Secretary-Treasurer.

Denton County Medical Society has elected Dr. M. L. Martin, Denton, President; Dr. M. L. Holland, Denton, Vice-President; Dr. M. D. Fullingrim, Denton, Secretary, reelected.

Eastland County Medical Society has elected Dr. W. L. Jackson, Ranger, President; Dr. T. E. Payne, Eastland, Vice-President; Dr. F. T. Isbell, Eastland, Secretary-Treasurer.

Fourth District Medical Society has elected Dr. J. F. Willerson, Lampasas, President, and Dr. C. T. Womack, San Angelo, Secretary.

Grayson County Medical Society has elected Dr. W. A. Lee, Denison, President; Dr. B. A. Russell, Sherman, Vice-President; Dr. E. F. Etter, Sherman, Secretary-Treasurer.

Grimes County Medical Society has elected Dr. G. C. Sanders, Richards, President, and Dr. H. L. Stewart, Navasota, Secretary.

Hunt County Medical Society has elected Dr. E. F. Wright, President; Dr. A. S. McBride, Vice-President; Dr. Joe Becton, Jr., Secretary-Treasurer, all of Greenville.

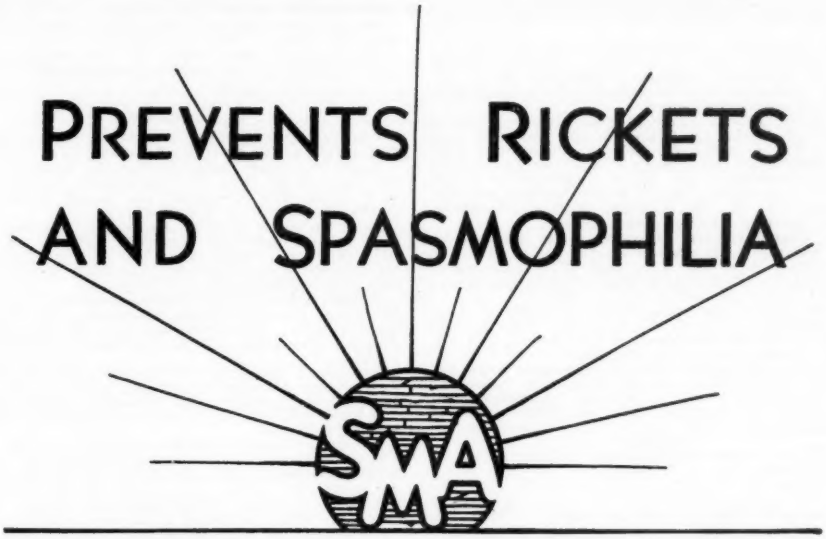
Jefferson County Medical Society has elected Dr. E. D. Mills, Beaumont, President; Dr. L. C. Powell, Beaumont, Vice-President; Dr. C. H. Hendry, Beaumont, Secretary-Treasurer.

Lamar County Medical Society has elected Dr. R. L. Lewis, Paris, President; Dr. J. E. Armstrong, Blardstown, Vice-President; Dr. Scott Hammond, Paris, Secretary-Treasurer, reelected.

Lubbock-Crosby Counties Medical Society has elected Dr. Allen T. Stewart, Lubbock, President; Dr. H. C. Maxwell, Lubbock, Vice-President; Dr.

(Continued on page 52)

PREVENTS RICKETS AND SPASMOPHILIA



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IN ADDITION S. M. A. HAS THESE FEATURES:

- Only milk from tuberculin tested cows, from dairy farms that have fulfilled the sanitary requirements of the City of Cleveland Board of Health, is used as a basis for the production of S. M. A.
- No modification is necessary for normal full term infants.
- Resembles breast milk both physically and chemically.
- Simple for the mother to prepare.
- It gives excellent nutritional results in most cases, and these results are obtained more simply and more quickly.

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(Continued from page 50)

R. L. Powers, Lubbock, Secretary-Treasurer, re-elected.

Liberty-Chambers Counties Medical Society was recently organized and the following officers elected: Dr. J. T. Tadlock, Dayton, President; Dr. G. H. Fahring, Anahuac, Vice-President; Dr. H. Caplovitz, Liberty, Secretary-Treasurer.

The Texas Ophthalmological and Otolaryngological Society met December 5 and 6 and the following officers were elected: Dr. W. R. Thompson, Fort Worth, President; Dr. William E. Howard, Dallas, First Vice-President; Dr. H. T. Aynesworth, Waco, Second Vice-President; Dr. A. F. Clarke, San Antonio, Secretary; Dr. M. H. Boerner, Austin, Treasurer. The next meeting will be in San Antonio.

North Texas Medical Association at its fiftieth annual meeting in December elected Dr. Andrew B. Small, Dallas, President; Dr. Owen R. O'Neill, Paris, Vice-President; Dr. Ralph S. Usry, Dallas, Secretary-Treasurer, reelected.

At a meeting of the State Board of Health at Austin, December 15, Dr. J. C. Anderson, Austin, was reelected ex-officio President of the Board, and Dr. John W. Burns, Cuero, Vice-President.

Dr. L. Barton Leake, who is associated with Dr. George S. McReynolds, of the Eye, Ear, Nose and Throat Department of the King's Daughters Hospital, Temple, is taking a four months' course in the postgraduate school of Harvard University.

Deaths

Dr. William Royal Blackshear, Chireno, aged 80, died November 5.

Dr. Edward A. Blount, Dallas, aged 56, died December 8 of acute myocarditis.

Dr. James D. Gray, Yoakum, aged 59, died December 5.

Dr. Roy Harris, Quitman, aged 46, died November 3 in Winnsboro of nephritis.

Dr. John Moorman Johnson, Rio Hondo, aged 57, died November 10 after an extended illness.

Dr. William T. Booth, Denison, aged 74, died November 9.

Dr. Thomas Buchanan Sadler, Corsicana, aged 61, died November 13 of heart disease.

Dr. Benjamin Ernest Witte, San Antonio, aged 60, died November 27 of myocarditis.

Dr. Clarence Ray Williams, Wills Point, aged 48, died November 17 of cerebral hemorrhage.

VIRGINIA

The Tri-State Medical Association of the Carolinas and Virginia will meet at Richmond, February 16-17.

Lynchburg and Campbell County Medical Society has elected Dr. Don Preston Peters, President; Dr. D. P. Scott, Vice-President; Dr. Ernest G. Scott, Secretary-Treasurer, all of Lynchburg.

Northern Neck Medical Association has elected Dr. E. T. Ames, Montross, President; Dr. Samuel Downing, Newport News, and Dr. W. B. Richardson, Heathsville, Vice-Presidents; Dr. R. E. Booker, Lottsburg, Secretary-Treasurer.

Pulaski County Academy of Medicine has elected Dr. D. S. Divers, Pulaski, President; Dr. J. B. Millard, Draper, Vice-President; Dr. R. F. Thornhill, Pulaski, Treasurer; Dr. C. E. Bowles, Pulaski, Secretary.

Richmond Academy of Medicine has elected Dr. J. Morrison Hutcheson, President; Dr. A. S. Brinkley and Dr. Charles M. Caravati, Vice-Presidents; Dr. Mark W. Peyser, Secretary-Treasurer, reelected, all of Richmond.

Southside Virginia Medical Association has elected Dr. Ruth Mason, Petersburg, President; Dr. G. Richardson Joyner, Suffolk, Dr. M. H. Tredway, Emporio, Dr. Linwood Farley, Courtland, and Dr. Herbert C. Jones, Petersburg, Vice-Presidents; Dr. R. L. Ralford, Franklin, Secretary-Treasurer, reelected.

University of Virginia Medical Society has elected Dr. H. B. Mulholland, University, President, and Dr. E. L. Corey, Secretary, reelected.

At the annual meeting of the Seaboard Medical Association of Virginia and North Carolina Dr.

(Continued on page 54)

"Feed a Cold"

Perhaps there was some justification for this old therapeutic axiom, but there is no doubt as to the value of the more recent dictum which emphasizes the importance of alkalinization in the treatment of respiratory affections in general.

For a safe, effective and palatable method of securing alkalinization without upsetting the stomach or tending toward alkalosis, try

KALAK WATER

the strongest alkaline water of commerce. Kalak Water is an antacid—not a laxative.

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It is characteristic of most babies fed on milk properly modified with Mellin's Food that they are not troubled with constipation

Mellin's Food A Milk Modifier

Constipation in Infancy

CONSTIPATION in infancy is worthy of the physician's careful attention, for this symptom is often an indication of some fault in the diet which should be corrected, not only as a measure of relief from this annoying condition but to obtain a better-balanced food mixture.

Continued constipation is very good evidence that the food elements entering into the making of the baby's diet are not well suited to an infant's digestion or are not in exactly the right proportion, and such a situation may easily be responsible for a slow gain in weight, restless nights and a fretful, uncomfortable baby. Progress in general is likely to be more satisfactory if the contents of the lower bowel are eliminated at fairly regular daily intervals. Therefore, it is consistent with good treatment to exercise every effort to promote normal stools.

ERRORS in diet causing constipation may be determined by observing the color, odor and character of the stools, and by noting the general condition and progress of the baby patient. These points of recognition of symptoms are taken up in a pamphlet which should prove very helpful in readjusting the diet to overcome constipation. *A copy will be sent to physicians upon request.*

Mellin's Food Company, Boston, Mass.

Mellin's Food meets all the purposes of a milk modifier

(Continued from page 52)

James H. P. Culpepper, Norfolk, was elected President, and Dr. Clarence Porter Jones, Newport News, Secretary, reelected. The next convention will be held in Suffolk the first Tuesday in December 1931.

Dr. J. William Humphries, Culpeper, has been appointed a member of the Culpeper County Board of Health, filling vacancy of Dr. Otis Marshall, resigned. Dr. Marshall will be connected with Red Cross headquarters at Washington, D. C.

Major Guy L. Qualls, who was stationed for several years at Fort Eustis, has been transferred to Forth Leavenworth, Kansas.

Dr. H. C. Grant, formerly of Norfolk, after an absence from the State of several years, has returned to Remington for the practice of medicine.

Dr. A. M. Byrd, formerly of Warm Springs, is now located at Phoenix, Arizona.

Dr. Henry G. Parker, City Bacteriologist of Norfolk since 1917, and recently Assistant Director of Public Welfare, has been made Director of Public Welfare to succeed Dr. Powhatan S. Schenck. Dr. Schenck is on indefinite leave of absence on account of ill health.

Dr. W. M. Phipps, Hopewell, has been elected a member of the Board of Directors of the Kiwanis Club of that city.

Dr. Richard Williamson Fowlkes, Richmond, and Miss Louise Fishburn, Roanoke, were married November 15.

Dr. Warren Womack Koontz, Roanoke, and Miss Mary Winston Woodson, Lynchburg, were married November 5.

Dr. Blake Walden Meador and Miss Ethel Marchant Hale, both of Richmond, were married the latter part of December.

Dr. E. Lee Shiflett, Elkton, and Miss Ruth Bryant McDonald, Goshen, were married October 25.

Dr. Charles P. M. Sheffey, Lynchburg, and Miss May Joy Burch, Richmond, were married December 31.

Deaths

Dr. William Virgil Atkins, Blackstone, died December 7 of angina pectoris.

Dr. John Charles Burks, Roanoke, aged 57, died December 5.

Dr. John Reveley Guerrant, formerly of Franklin County, died in Salt Lake City, Utah, December 19.

Dr. James Wood Jordan, Beaverdam, aged 53, died December 7.

Dr. James W. Kelly, Big Stone Gap, aged 69, died December 11, of pneumonia.

Dr. William Jeffries Newbill, Irvington, aged 83, died December 15.

Dr. Delmar F. Weaver, Orange, aged 58, died December 12.

WEST VIRGINIA

At the fifth annual meeting of the Hospital Association of West Virginia held recently Dr. Walter E. Vest, Huntington, was elected President-Elect; Dr. A. G. Rutherford, Welch, First Vice-President; Dr. H. H. Haynes, Clarksburg, Second Vice-President; and Dr. W. A. Welton, Fairmont, a member of the Board of Trustees.

Wyoming County Medical Society was organized November 18 at a meeting attended by Dr. Walter E. Vest, Huntington, and Mr. Joe W. Savage, Charleston, President and Secretary, respectively, of the State Medical Association.

At a recent meeting of the Public Health Council at Morgantown regulations were adopted raising the requirements for the licensure of physicians.

Dr. A. D. Knott, Parkersburg, has been elected President of the West Virginia Public Health Association.

Dr. Edward J. Van Liere and Miss Alice Evelyn Hartley, both of Morgantown, were married November 10.

Deaths

Dr. Allen H. Carr, Princeton, aged 79, died November 14 of strangulated hernia, myocarditis and arteriosclerosis.

Dr. Luther W. Leonard, formerly of St. Albans, died in a Charleston hospital December 19.

Dr. Percy John McElrath, Bramwell, aged 60, died recently of heart disease.

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